PMD-4/4R

System Operation and Maintenance

PN: 100140-01

DRAFT

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Revision History

This document supersedes all previously issued versions, providing new or revised information. The most recent publication can be determined by comparing the last three characters at the end of the part number and the date issued.

PMD-4/4R
System Operation and Maintenance
Part Number 100140-010-AA0

Revision Level	Date Issued	General Description of Changes
AA0	xx/xx/xx	Initial Release

Important Information

Conventions

Safety Alert Symbols

The symbol indicates that important personal safety information follows. Carefully read this text for the warnings information it contains. The signal word next to each safety alert symbol is defined as:

WARNING *Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Reference SRAC2.*

CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. This signal word may also be used to identify unsafe practices.

Static Sensitive Symbols for Equipment Handling Instructions

The and symbols indicate important handling guidelines established by the AREMA (American Railway Engineering and Maintenance of Way Association) for proper handling of electronic equipment modules and sensitive components for the prevention of potential damage that could be caused by ESD (electrostatic discharge) during routine maintenance, handling and transportation.

Module ESD Notice To protect against ESD damage to electronic equipment containing modules, follow the field procedures in AREMA C&S Manual, Part 11.4.5. Failure to use protective measures could result in permanent equipment damage, either immediate or latent, when handling modules.

Component ESD Notice To protect against ESD damage to electronic equipment containing components, follow the field procedures in AREMA C&S Manual, Part 11.4.5. Failure to use recommended protective measures could result in permanent equipment damage, either immediate or latent, when handling components.

Important/Notable Information

Important: *Indicates an operating procedure, practice, or condition which, if not strictly followed, may cause equipment damage.*

Note: *Indicates additional information or emphasizes a topic related to the subject being discussed.*

General Safety Instructions

WARNING

It is the railway's responsibility to ensure that only qualified personnel work on or around this equipment and to prevent any unauthorized tampering. To ensure the highest degree of safety, all personnel are required to become thoroughly familiar with all personal safety instructions contained in this manual. Successful and safe operation of this equipment is dependent upon correct handling, operation, maintenance, repair, and application of associated railroad equipment. Deliberate misuse or abuse of electronic safety equipment may result in injury or death.

No information in this manual supersedes or replaces your railroad's operating rules. If there is a difference in instructions between this manual and the railroad's operating rules, follow the most restrictive instruction.

Railroad Configuration Management Procedures must ensure that all PMD-4/4R units are configured with the proper revisions of modules and firmware (both application and executive) and that updates are completed in a timely manner when made available by GE Transportation Systems Global Signaling. Operating with incorrect firmware may result in death or serious injury. Timely is defined as without undue delay per 49 CFR 236.1023(j).

Updating or modifying modules, firmware, and values (both application and executive) must be performed by qualified personnel that are physically present at the site being updated.

Railroad Configuration Management Procedures must ensure that the proper values are set for each crossing parameter, vital timer, vital configuration setting (vital soft switches), PTC Wireless Crossings vital parameters, and vital remote parameter in their PMD-4/4R units. Incorrect settings may result in death or serious injury.

Deliberate misuse or abuse of electronic components may cause personal injury or death.

To avoid personal injury or death due to collision, follow your railroad's operating rules while moving a locomotive with inoperative equipment or during irregular operating situations.

Track circuit troubleshooting interferes with signal system operation. Always obtain proper authorization prior to performing track circuit troubleshooting.

Do not use this equipment until you are sure the application logic is properly programmed and functionally tested. Test it according to United States DOT (Department of Transportation) FRA (Federal Railroad Administration) Code of Federal Regulation, Title 49 procedures, or other equivalent tests, as deemed necessary by other appropriate regulatory agencies.

If any failure of the equipment is detected, it is the railroad's responsibility to ensure the failure is reported in a timely manner. Once the failure is reported, the appropriate steps must be taken to ensure the equipment is repaired or replaced promptly. Failure to report and repair unit/module in a timely fashion may result in death or serious injury. Timely is defined as `without undue delay per 49 CFR 236.1023(j).

Failure to follow the instructions in this manual may result in short or long warning times. Short warning times may result in death or serious injury. Reference SRAC2.

WARNING

If a train stops on the approach and accelerates toward the crossing, the PMD-4/4R may not provide a minimum 20 seconds of warning time. Short warning times could result in death or serious injury.

If a train accelerates toward the crossing after the PMD-4/4R has activated the warning system, the PMD-4/4R may not provide a minimum 20 seconds of warning time. Short warning times could result in death or serious injury. Reference SRAC2.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION

Modifications or changes not expressly approved by GE Transportation Systems Global Signaling could affect the compliance of the equipment with the FCC Rules and void the user's authority to operate the equipment.

Foreword

There are no electronic components or modules in the PMD-4/4R system that can be repaired by the customer. Defective or damaged modules should be sent to GE Transportation Systems Global Signaling, Customer Service Department, P.O. Box 600, Grain Valley, MO 64029-0600.

Technical Support

GE Transportation Global Signaling will accept telephone calls between 7:30 AM and 5:30 PM CST. Call TOLL FREE (800) 825-7090 regarding installation, maintenance, calibration, adjustment, or repair of any components.

Scope

GE Transportation Global Signaling, Technical Information Department under the direction of the designated equipment Product Manager, issues this document. The manual introduces you to the PMD-4/4R system by providing specific information related to Introduction, Installation, Parameter Setup, Adjustment, and Calibration, Maintenance, Troubleshooting, DISPLAY Navigation, Web Graphical User Interface, Terminal (DCP) Navigation, Retest Guide, Specifications and Appendix . Please read carefully and thoroughly understand the instructions and processes before making any adjustments or modifications to the equipment. Carelessness may result in loss of life or property damage.

How to Order an Additional Copy or a Revised Printing

Additional copies of this document may be ordered by directing all correspondence to GE Transportation Global Signaling, Customer Service Department, 2712 S. Dillingham Rd., Grain Valley, MO 64029-0600 or calling (800) 825-7090 or by FAX (816) 650-9501.

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Grade Crossing Location Record

Chassis ID _____ **Warning Time CRC** _____

Location _____ **Milepost** _____ **DOT** _____ **Date** _____/_____/_____

		Version	CRC
Executive Software Program	A Processor	_____	_____
	B Processor	_____	_____
	C Processor	_____	_____

Application Program Name _____ **Checksum** _____ **CRC** _____

Track Setup

Approach Frequency _____

Master/Slave Operation □ Master □ Slave

Transmitter Check Value (-7.0 to 13.0 Ohms) _____

Approach Direction Mode □ Uni □ Bi

Lumped Impedance Adjustment Value (-9 to +9) _____

Auto RX □ Disabled □ Enabled

False Shunt Detect setting □ Disabled □ Enabled RX _____ Time (min) _____

Approach Release setting □ Disabled □ Enabled RX _____ Time (min) _____

LOS Time (seconds)

Approach Maintenance

Phase Compensation Value (0 to 10 degrees) _____

Ballast Compensation Value (50 to 250) _____

Island Setup

Island Type □ External □ Internal

Island Setup (When Internal is selected)

Island Frequency (KHz) □ 0 □ 4.0 □ 4.4 □ 4.9 □ 5.4 □ 5.9 □ 6.4 □ 7.1 □ 7.7 □ 8.0

Island LOS (seconds) □ .5 □ 2.0 □ 4.0

Island Fault Setting □ 1 □ 2

Chapter 1 – Introduction

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Chapter 1 – Introduction

Introduction

This manual contains information describing the PMD-4/4R system configured for highway/rail grade crossing applications. Included in this manual are introduction (including theory of operation), installation, unit description, setup and calibration, maintenance and troubleshooting for the PMD-4/4R.

PMD-4/4R General Description

The PMD-4/4R system is crossing control system used to detect approaching trains. Capabilities of the PMD-4/4R include: Motion detection control, crossing island train detection, vital inputs monitoring and vital relay drive output control. The PMD-4/4R has provisions for expansion to wireless crossing control and prediction capabilities with the optional selective function upgrade.

The PMD-4/4R has a built in recorder that logs time-stamped vital and non-vital events as well as state changes, crossing performance data, and failures/reset information. All recorded events are user printable both track-side and in the office.

The PMD-4/4R consists of a central processor, track and IO controllers, communications interface and a LCD display with keypad/button interface. Front panel indicators display module health status, and indicators for monitoring active I/O signals. The Web Graphical User Interface (web GUI) or LCD display serve as the man/machine interface for system installation/setup, parameter adjustment, and system testing/troubleshooting. The Web GUI is operated by a separate computer / PDA device running an Internet Explorer (or compatible) web browser.

System Block Diagram

The PMD-4/4R System Block Diagram shows how the PMD-4/4R internal modules interconnect, and the main inputs and outputs. The PMD-4/4R System Block Diagram is shown in **Figure** X-X below.

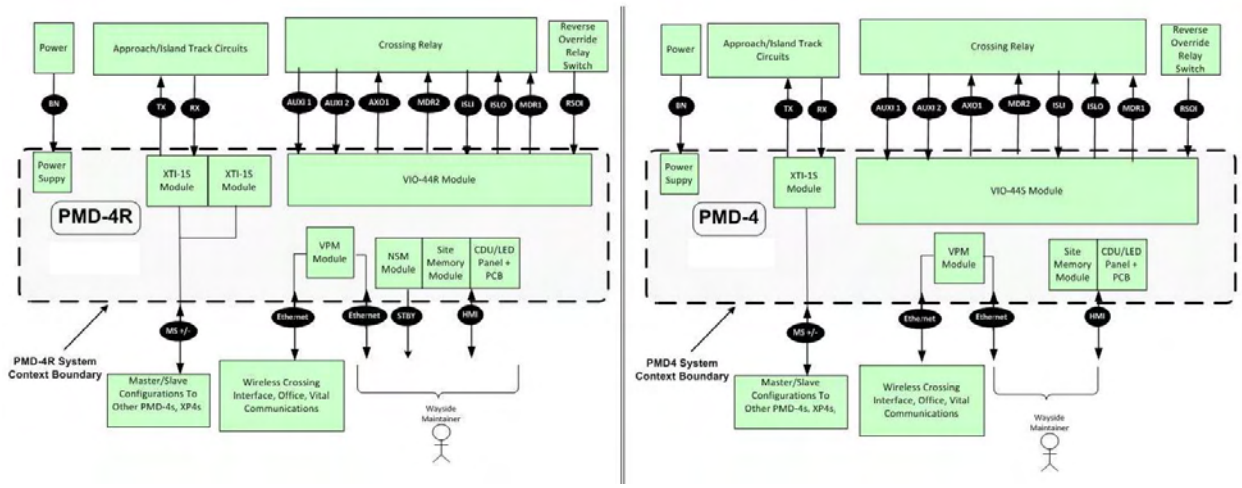


Figure X-X

Theory of Operation

The PMD-4/4R detects train movement toward a railroad/highway intersection by monitoring a controlled AC signal that it transmits to the railroad track. Two sets of leads are required to complete the track circuit. One set of leads is used to transmit the signal onto the track and another set of leads is used to monitor/receive the signal on the rail. The transmitter and receiver leads are spaced apart and the track between the leads is called the Island. Both the voltage (RX) and phase angle of the received signal are measured. RX is used to determine train speed and distance. Phase angle is used to determine ballast conditions.

The distance that a train can be detected on each side of the island is called the approach. The length of the approach is a function of the maximum allowable train speed at that location per railroad operating rules and the minimum acceptable warning time. For an unoccupied approach, RX is adjusted to 100. When a train moves inbound on the approach, RX decreases linearly in relation to the train's lead axle location relative to the crossing. For example, when the train has moved one quarter of the way into the approach the RX will equal 75. Figure **X-X** below depicts a train moving through a crossing and following table describes the sequence of events that occur in response to train movement.

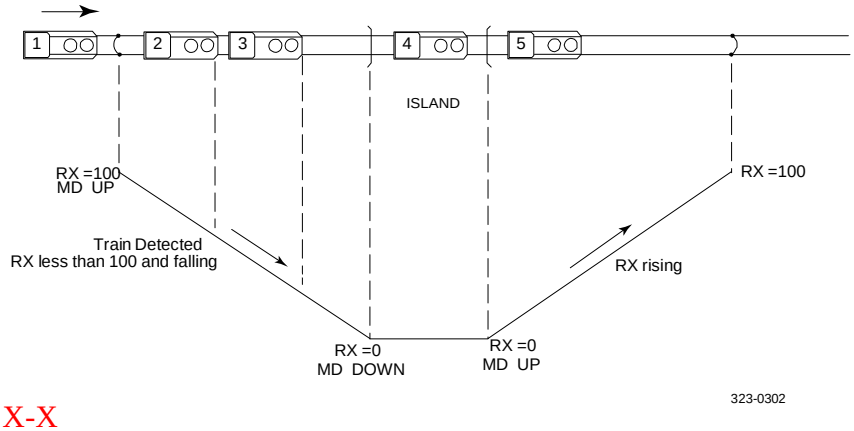


Figure X-X

TRAIN POSITION	PMD-4/4R Crossing Subsystem RESPONSE
Position 1 - Inbound train outside the approach (RX = 100)	Train not detected no response.
Position 2 - Train detection (RX falling)	A train moving inbound on the approach causes a change in the received voltage level and phase. The rate at which the received signal changes, is used to determine train speed and anticipated arrival time at the crossing.
Position 3 - Crossing activated	When sufficient inbound motion is detected or the calculated arrival time to the crossing equals the selected warning time in limited predict mode, the PMD-4/4R Crossing Subsystem activates the crossing warning system.
Position 4 - Train in Island (RX = 0)	The Random Signature Island (RSI) function of the PMD-4/4R Crossing Subsystem monitors train presence in the Island and provides positive control of the relay output with a train in the island circuit.
Position 5 - Train leaves Island (RX rising)	As the last set of wheels leave the Island, the island circuit recovers and the PMD-4/4R Crossing Subsystem de-activates the crossing warning system as the train proceeds outbound.

Island Operation

The island is that portion of the track between the transmitter and receiver leads. Motion cannot be detected when a train is in the Island (i.e. moving between the transmitter and receiver leads) because the train shunts out the transmitted signal and the receiver voltage is zero. Island occupancy detection is provided by transmitting and receiving a signal called Random Signature Island (RSI). RSI is an AC signal with a randomized modulation scheme. The RSI is transmitted and received through the same leads as the approach signal described previously. The table below describes the RSI transmitter and receiver functions.

RSI Functions	
Island Transmitter	• Transmits a short signal burst to the track through the transmitter leads. • The signal burst is coded with a signature that changes randomly from one burst to another. • Signal signature consists of changes in the time delay between bursts, the transmitted frequency of each burst and the number of cycles in each burst.
Island Receiver	• Receives the short signal burst from the track through the receiver leads. • The received signal is used to determine when a train is occupying the island • Island occupancy is determined when the received signature is not correct or the signal amplitude is below the minimum threshold.

High Signal

A properly configured PMD-4/4R in a crossing configuration will detect an open/broken rail condition within its approaches to prevent any loss of warning time. At installation, the PMD-4/4R is adjusted so that an RX of '100' is detected for a clear approach. A High Signal is declared whenever the RX level increases to a preset value of 110 or above, indicating an open/broken rail condition exists within the approach.

Low Phase Detection

A properly configured PMD-4/4R can detect when a change in ballast conditions has occurred that could affect RX and result in a loss of warning time. Phase angle is used to monitor ballast conditions. When phase angle is below the minimum acceptable value for the associated RX level, a Low Phase condition is declared. The Low Phase threshold versus RX value is shown in Figure X-X below.

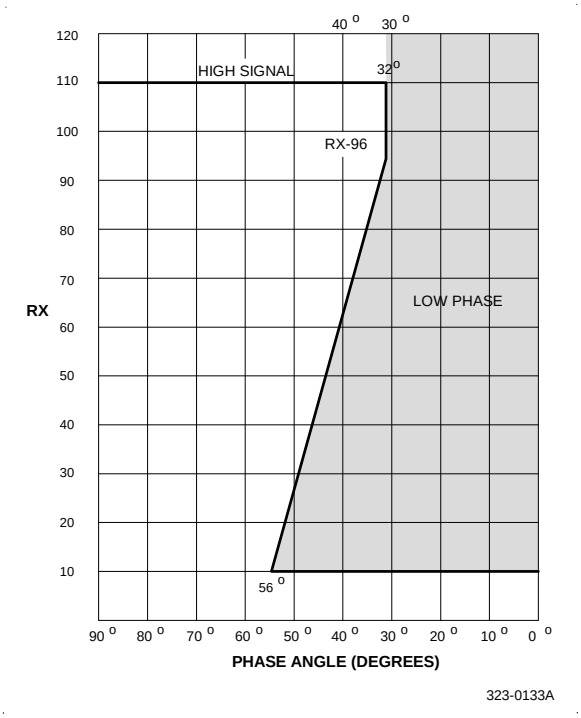


Figure X-X

Chassis Components

The PMD-4/4R chassis contains the central processor, track and IO controllers. The On/Off power switch is located on the left side of the chassis. There are no serviceable parts inside the chassis. Fuses are located on the front and right side to protect internal circuitry. The chassis has a built in display and keyboard. All external connections are via WAGO connectors on the sides of the chassis. LEDs on the front are used for setup and diagnostic purposes. Setup parameters are stored on a memory module on the right side of the chassis which enables chassis change out without needing to re-enter setup parameters.

Chassis Connectors and Power Switch

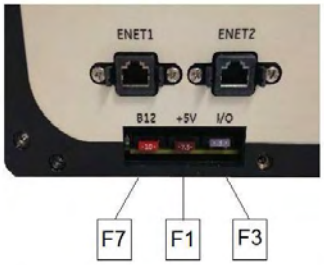
J1 – B12/N12 Power Connector

J2 – Site Specific Memory Module

J3 – Master / Slave on PMD-4/4R & Standby Indicator output PMD-4R only

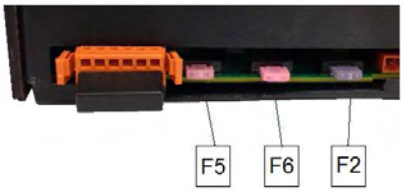
J16,17 & 18 – Track & Vital Inputs and Outputs Connector

Chassis Fuses



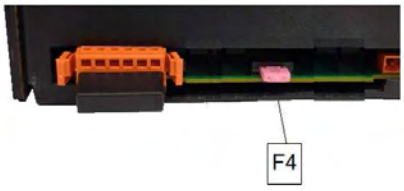
PMD-4/4R Front Panel Fuses

F7 – 10A Main Power Fuse
F1 – 7.5A +5 Volt Power Fuse
F3 – 3A Input Output Module Fuse



PMD-4R Right Side Fuses

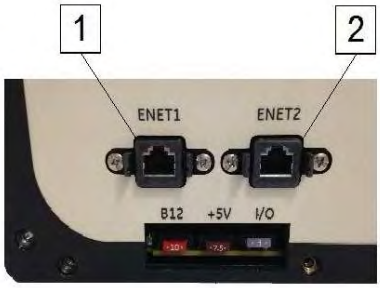
F5 – 4A Standby XTI Fuse
F6 – 4A Normal XTI Fuse
F2 – 3A Normal/Standby Module Fuse



PMD-4 Right Side Fuses

F4 – 4A XTI Fuse

Ethernet Ports



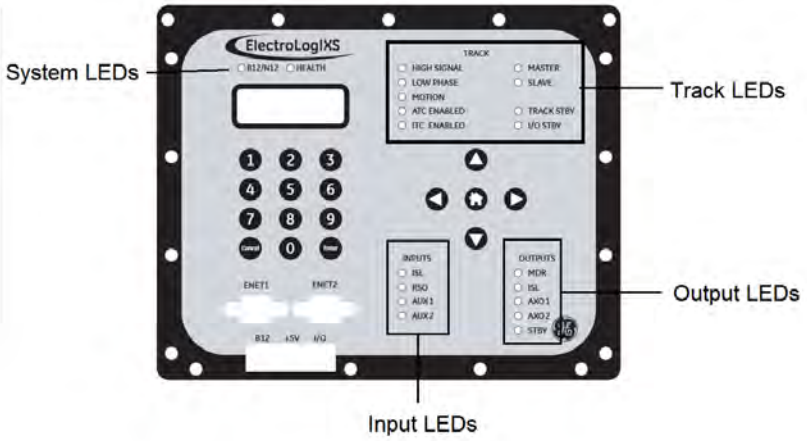
1 – Ethernet Port 1 Default 192.168.0.11
2 – Ethernet Port 2 Default 192.168.1.12

Display and Keypad

The PMD-4/4R front panel has a 4 line 40 character LED high contrast display for viewing and entering information.

The key pad consisted of ten tactile feel buttons labeled 0 to 9 with a Cancel and Enter button. Left/right and up/down buttons are used for selecting menu option and scrolling the display characters. A home button is available to return to the main home menu from anywhere in the menu structure.

Front Panel LEDs



System LEDs

- B12/N12 LED is on when power is applied to the B12 and N12 power connector
- HEALTH LED is on when all internal module health statuses are healthy

Track LEDs

- High Signal LED will be on when a high signal is detected. The LED will remain on until the High Signal/Low Phase is reset.
- Low Phase LED will be on when a low phase condition has been detected. The LED will remain on until the High Signal/Low Phase is reset.
- Motion LED will be on when motion is detected on the approach.
- ATC Enabled LED will be on when the approach track circuit is enabled. This LED will flash when the approach track circuit is disabled.
- ITC Enabled LED will be on when the island circuit is enabled. This LED will flash when the island circuit is disabled.
- Master LED will be on when the approach circuit is configured as the master.
- Slave LED will be on when the approach circuit is configured as a slave.
- Track STBY LED (PMD-4R Only) will be on when the XTI track module is on the standby module.
- I/O Standby LED (PMD-4R Only) will be on when the Vital I/O module is on the standby side.

Input LEDs

- ISL LED is on when voltage is applied to the ISL input.
- RSO LED is on when voltage is applied to the RSO input.
- AUX1 LED is on when voltage is applied to the AUX1 input.
- AUX2 LED is on when voltage is applied to the AUX2 input

Output LEDs

- MDR LED is on when the unit is providing 12 vdc on the MDR output.
- ISL LED is on when the unit is providing 12 vdc on the ISL output.
- AXO1 LED is on when the unit is providing 12 vdc on the AXO1 output.
- AXO2 LED is on when the unit is providing 12 vdc on the AXO2 output.

Processor Operation

CPU A and CPU B

CPU A and CPU B are responsible for the system's vital application logic processing, communication, and control of the inputs and outputs and the continual performance of the system safety checks.

User supplied configuration information is used by CPU A and CPU B during application program execution and is vitally stored in non-volatile memory on the site specific memory module. The unit may be replaced without loss of the system configuration information.

CPU C

CPU C is responsible for external communications, diagnostics and the user display and touchpad interface. It also maintains non-volatile diagnostic logging in the Error, Recorder, Communication, and Configuration logs.

Ethernet Interface

The PMD-4/4R provides two Ethernet ports that support 10BASE-T and 100BASE-T communications and auto-negotiate with the connected network device for speed selection. The Ethernet ports also auto-detect straight versus crossover connection types so either cable type can be used.

Error Log

The PMD-4/4R Error Log captures error / system event information when a detected error / event occurs. The Error Log entries indicate the date and time of the event, the processor that declared the error / event and a description of the error / event. The PMD-4/4R is capable of storing approximately the most recent 5,000 Error Logs entries.

Recorder Log

The Recorder Log captures the state / state change of application statuses as indicated in the application program defined by the application design engineer. To record the values of a particular status in the Recorder Log, the named status must be indicated as a recorded status in the application.

A named status indicated in the application program as a recorded status is logged in the Recorder Log each time the status changes state along with the date and time of the change. The PMD-4/4R Recorder Log is sized to record the most recent 100,000 entries of up to 512 Vital and 512 Non-vital recorded statuses.

Configuration Log

The Configuration Log captures parameter / configuration setting changes as they are made to the system configuration information used by the PMD-4/4R system. When configuration settings are changed, CPU C captures the change and the date / time of the change in the Configuration Log. The Configuration Log is sized to capture the most recent 1000 Configuration change events.

Train Data Log

The Train Data log stores 248 millisecond samples of crossing related data from 30 seconds prior to any MDR Status dropping until 10 seconds after the MDR Status is picked back up. This log stores the last 15,000 entries. Each Train Data Log entry contains the following:

- Time/Date stamp
- RX value
- Phase value
- Island Assignment Status state
- MDR Status
- AUX Status
- RSO Status
- Advance Preempt (AP) Statuses

Train Record Log

Each time a train occupies an Island, the PMD-4/4R generates a Train Record Log entry to provide a history of crossing related information for each train passage. The PMD-4/4R will store the last 5000 train moves in this log. The following data is logged in each Train Record log entry:

- MDR Status Mnemonic/Number
- Actual Warning time
- Predicted Warning Time
- Detection Mode

System Event Log

The System Event Log records the current state of any configured ISL, MDR, AUX, RSO, or AP status when any one of these changes. It also records the current value for RX & Phase of each configured approach track circuit. The log stores approximately the last 15,000 entries.

Ring Status Log

Each time the MDR drops, the PMD-4/4R generates a Ring Status Log entry to provide information about the MDR. The PMD-4/4R stores the last 450 entries into this log. Each Ring Status Log entry contains the following:

- Time/Date stamp
- MDR Ring Statuses

PMD-4/4R Crossing Track Interface

The PMD-4/4R provides 2 track circuits for crossing control applications:

- An approach track circuit used for motion detection or constant warning prediction of trains traversing an approach, and
- An island track circuit used to detect the train presence near/within the island.

Approach Transmitter

The Approach Transmitter circuitry provides a continuous sinusoidal signal at various programmable frequencies to the crossing approach track. It is driven by a sine wave signal generated by either the digital signal processors or the Master/Slave circuitry. The approach transmitter provides digital gain control of the output signal. The approach transmitter shares a single interface to the track with the Island Transmitter.

Master/Slave

The Master/Slave interface allows multiple approach transmitters to be synchronized (PMD-4/4R, XP4 or HXP-3). If an ATC (Approach Track Circuit) is set for slave mode, the Master/Slave circuitry accepts an external signal and provides a synchronized signal to drive the approach transmitter. In master mode, the Master/Slave circuitry provides an external signal that is synchronized to its approach transmitter.

Island Transmitter

The Island Transmitter circuitry provides random signal bursts for train detection within the island limits. It generates the island signal bursts based on a quasi-random signature bursts received from the digital signal processors. The transmitter circuitry allows for digital gain control of the output signal for automated calibration.

Transmit and Receive Sense Circuitry

The Transmit and Receive Sense circuitry samples and digitizes information related to approach transmit signal, the island transmit signal, and the combined approach/island receive signal. This information is then sent on to the dual, digital signal processors, for filtering and analysis.

Digital Signal Processors

One DSP (Digital Dignal Processor) drives the approach transmitter while the other DSP drives the island transmitter. Both of the DSPs:

- Filter and determine frequency, amplitude, and phase of the approach transmit current and voltage
- Filter and determine amplitude and phase of the approach receive voltage
- Filter and determine amplitude, frequency, and burst length for the island receive signals.
- Pass this information on to the processor for further processing.

Vital Inputs and Outputs

The PMD-4 system provides the following configuration options:

a. PMD-4: Four general purpose, two wire, Vital Inputs and outputs.
b. PMD-4R: Four general purpose, two wire, Vital Inputs and outputs with I/O redundancy.

Vital I/O is used for monitoring vital inputs and supplying vital outputs according to the application equations. (The inputs can be used for inputs, Island inputs and other vital controls while the outputs can be used for vital control of crossing relays or remote crossing starts and other equipment).

Isolated DC/DC Converter

The Isolated DC/DC Converter provides isolation between the supply battery and the vital outputs.

Vital Inputs

The Vital Inputs are redundant general purpose two-wire inputs for the PMD-4/4R. When an input rises above 8.0 ± 0.5 Volts, it is considered energized. The vital input remains energized until the input voltage falls below 6.5 ± 0.5 Volts. Vital inputs will accept voltages up to 16.5 Vdc.

With the PMD-4R, if a vital input fails the module transfers to the redundant vital input. If a failure occurs where internal modules loses the vital input redundancy, the I/O STBY LED is turned off.

Vital Outputs

The vital outputs are redundant general purpose, two-wire outputs for the PMD-4/4R. All PMD-4 Vital Outputs are capable of driving load impedances of 150 ohms. All PMD-4R Vital Outputs are capable of driving load impedances of 50 ohms

With the PMD-4R if a vital output fails all the vital outputs are shut down for at least 30 seconds. After 30 seconds the vital outputs are transferred to the redundant vital outputs and they are set back to their energized or de- energized state. The vital outputs can be forced to switch to the redundant bank using the keypad. If a failure occurs where internal modules loses the vital output redundancy, the I/O STBY LED will be turned off.

Chapter 2 – Installation

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Chapter 2 – Installation

PMD-4/4R Shipment, Unpacking, and Inspection

The PMD-4/4R chassis may be shipped either by itself or installed in a rack assembly with other items, depending on the system ordered.

CAUTION If any shipping damage is detected, do not attempt to install or repair the PMD-4/4R. Contact GETSGS (GE Transportation Global Signaling) for repair or replacement of the damaged equipment.

WARNING *After Installation of an PMD-4/4R unit, adequate testing must be performed to detect any errors/failures of the application equations, equipment, or installation. The tests should be performed before the unit is placed into service and in accordance with standard railroad, FRA, and/or other regulatory agency rules. The tests should be performed by qualified personnel that have the knowledge to correctly and safely discharge the tests. Failure to adequately test the PMD-4/4R unit after installation could result in death or serious injury. Reference SRAC2.*

WARNING *After Installation of an PMD-4/4R unit, calibration of each Approach and Island must be performed. Calibration should be performed before the unit is placed into service and in accordance with standard railroad, FRA, and/or other regulatory agency rules. Failure to adequately calibrate the PMD-4/4R unit after installation could result in death or serious injury. Reference SRAC2.*

WARNING *During initial installation, proper operation of both the Normal and Standby system in the PMD-4/4RR configuration must be verified. Failure to verify proper operation of inactive modules could allow multiple failures over time to combine, resulting in an unsafe condition that could result in death or serious injury. Reference SRAC2.*

WARNING *Unauthorized modification of the PMD-4/4R installation may result in unsafe conditions that could result in death or serious injury. Responsibility for physically securing the PMD-4/4R from unauthorized access lies with the railway authority.Reference SRAC2.*

PMD-4/4R Mounting

The PMD-4/4R mounting dimensions are shown in Figure X-X below.

Figure X-X

Dimensions

Maximum Overall Height	**A**	10.5 “
Distance Between Mounting Holes	**B**	9”
Depth	**C**	8”
Width	**D**	13”

Chassis Mounting

Need to find out about brackets to mount on rack 19 and 24 inch

The chassis may be installed on a standard 19 inch (483mm) rack, wall mounted, or shelf mounted. If rack mounted, provide at least two inches of space above and below for cooling air flow. Secure the cabinet to the rack with at least four ½-inch 10-32 machine screws. If wall or shelf mounted, provide at least two inches of space above the chassis for ventilation.

Insert picture with dimensions

Figure X-X, PMD-4/4R Installation Dimensions.

Chassis Grounding

Insert picture Showing grounding point

MDSA-1/-1XS Mounting

The maximum outside dimensions of the MDSA-1/-1XS are 11 inches (280mm) wide, 7.0 inches (178mm) high, and 2.85 (73mm) inches deep. The MDSA-1/-1XS may be configured for rack or backboard mounting. The MDSA-1/1XS mounting dimensions are shown in Figure X-X below.

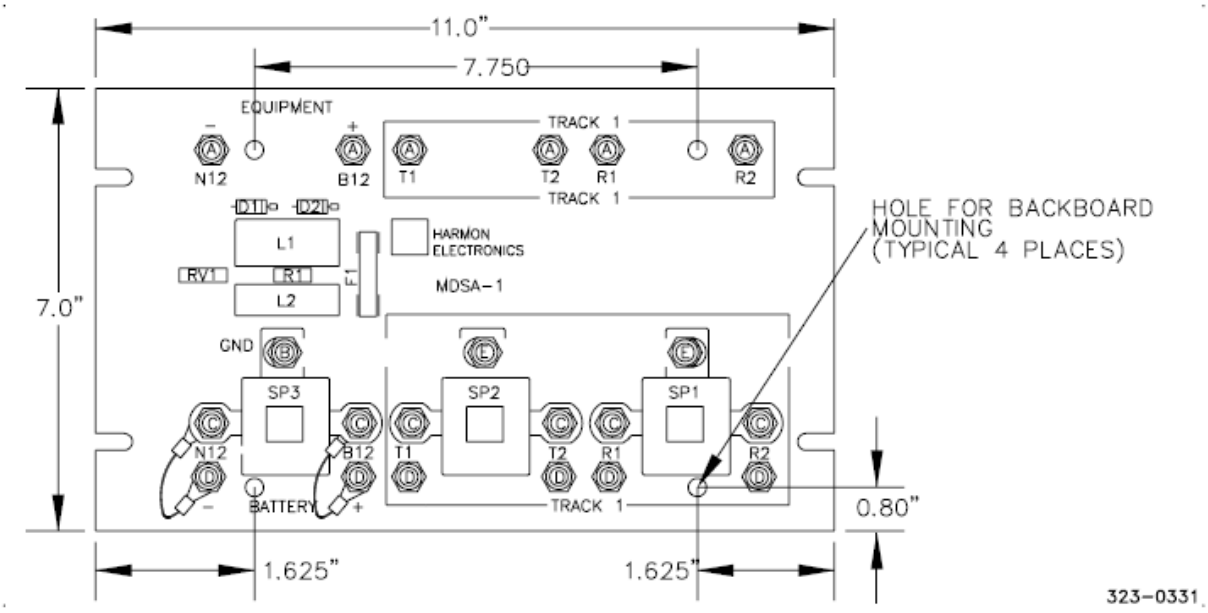

Figure X-X

The maximum outside dimensions of the MDSA-1/-1XS are 11 inches (280mm) wide, 7.0 inches (178mm) high, and 2.85 (73mm) inches deep. Refer to Figure X-X for a pictorial representation of the MDSA-1/-1XS mounting hole dimensions and locations.

The MDSA-1/-1XS may be configured for rack or backboard mounting. Refer to Figure X-X for the location of the four holes provided for backboard mounting.

Connecting System Battery and Track Connections

Connect system battery and track connections to the MDSA-1/1XS. The MDSA-1/1X Connections are shown in Figure X-X below.

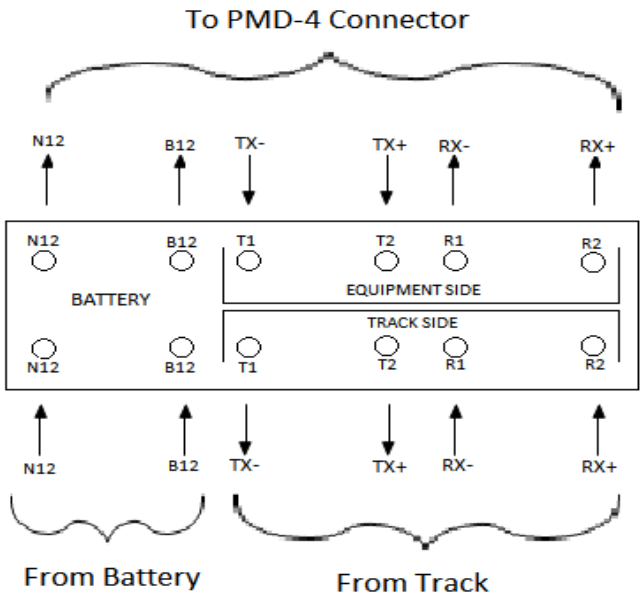

Figure X-X

PMD-4/4R Connectors

Power Connector

The PMD-4/4R has one connector, J1 on the left side of the chassis for track equipment power. Connect B12 and N12 from the MDSA-1/1X surge arrestor.

PMD-4/4R J1 Pin Outs	
1	2
B12	N12

Track and I/O Connectors

The PMD-4/4R has three connectors, J16, J17 and J18 on the bottom left side of the chassis for track connections and input and outputs. These connectors will be where the track connects to the MDSA-1/1XS and the inputs and outputs connect to the crossing control equipment.

PMD-4 J16, J17 and J18 Connectors

PMD-4 J16 Pin Outs									
1	2	3	4	5	6	7	8	9	10
TX+	N/C	TX-	N/C	RX+	N/C	RX-	N/C	ISL+ In	ISL- In
PMD-4 J17 Pin Outs									
1	2	3	4	5	6	7	8	9	10
RSO+ In	RSO- In	N/C	AUX1+ In	AUX1- In	N/C	AUX2+ In	AUX2- In	N/C	MDR+ Out
PMD-4 J18 Pin Outs									
1	2	3	4	5	6	7	8	9	10
MDR- Out	N/C	ISL+ Out	ISL- Out	N/C	AXO1+ Out	AXO1- Out	N/C	AXO2+ Out	AXO2- Out

PMD-4R J16, J17 and J18 Connectors

PMD-4R J16 Pin Outs									
1	2	3	4	5	6	7	8	9	10
TX+	N/C	TX-	N/C	RX+	N/C	RX-	N/C	MDR+ Out	MDR- Out
PMD-4R J17 Pin Outs									
1	2	3	4	5	6	7	8	9	10
ISL+ Out	ISL- Out	N/C	AXO1+ Out	AXO1- Out	N/C	AXO2+ Out	AXO2- Out	N/C	ISL+ In
PMD-4R J18 Pin Outs									
1	2	3	4	5	6	7	8	9	10
ISL- In	N/C	RSO+ In	RSO- In	N/C	AUX1+ In	AUX1- In	N/C	AUX2+ In	AUX2- In

Master / Slave and Standby Indicator Connector

The PMD-4/4R has one connector, J19 on the front on the bottom right side of the chassis for master/slave connections and the non-vital standby indicator output on the PMD-4R only.

PMD-4 J19 Connector

PMD-4 Connector J19 Pin Outs					
1	2	3	4	5	6
MS+	MS-	MS+	MS-	N/C	N/C

PMD-4R J19 Connector

PMD-4 Connector J19 Pin Outs					
1	2	3	4	5	6
MS+	MS-	MS+	MS-	STBY- Out	STBY+ Out

Wiring Requirements

WARNING *A short circuit between the transmitter and receiver terminals will bypass the island circuit causing the island receiver to remain energized while a train is in the island. Failure to detect a train in the island could result in death or serious injury. Reference SRAC2.*

- Run all wires as directly as possible to minimize wire lengths.
- Provide a twist of 1 turn per foot for track wires connected to the PMD-4/4R transmitter terminals.
- Provide a twist of 1 turn per foot for track wires connected to PMD-4/4R receiver terminals.
- Provide a twist of 1 turn per foot for battery wires connected to the PMD-4/4R battery terminals and I/O lines.

Note*: The correct phase relationship must be maintained between the transmitter and receiver leads for correct PMD-4/4R operation. Make sure TX+ and RX+ are connected to one rail, and TX- and RX- to the other rail. Reversed connections will cause the PMD-4/4R to declare a "Reversed Leads" fault.*

- Use No. 14 AWG wire or larger on the following terminals between the PMD-4/4R and the MDSA or other equipment:

  B12, N12 RX +, RX - M/S +, M/S - MD Relay Island Relay

- Use No. 10 AWG wire or larger on the following terminals between the PMD-4/4R and the MDSA:

  TX+, TX-

- No. 9 AWG track wire is the minimum size acceptable for use between the MDSA and track connections.
- No. 6 AWG track wire is the recommended size for use between the MDSA and track connections.

Transmitter - Receiver Track Lead Length

The PMD-4/4R provides two terminals for the transmitter wires (TX + and TX -) and two terminals for the receiver wires (RX + and RX -).

Maximum Track Lead Length <u>With</u> an Island

When the PMD-4/4R track leads encompass a crossing Island, the combined total length of the Transmitter-Receiver track lead should not exceed 500 feet (152m). The transmitter (TX+, TX-) leads should be connected on the bungalow or short lead side of the crossing.

For example:

When an Island circuit is used:

If receiver leads are 400 feet (122m) long (due to a very long Island), transmitter leads may not exceed 100 feet (30m) in length (500 feet (152m) total).

***Note**: Transmitter/Receiver lead length refers to the length of the twisted pair required to connect the MDSA to the track.*

For approach distances less than 1,000 feet (305m), transmitter lead length should not exceed 25% of the PMD-4/4R approach distance.

Maximum Track Lead Length Without an Island

The transmitter lead length for Unidirectional approach tracks without an island should be limited to the values given in Table below as a function of frequency and approach length.

	MAXIMUM UNIDIRECTIONAL TX LEADS (FEET - ONE WAY)																	
FREQ	AL=500'	AL=1000'	AL=1500'	AL=2000'	AL=2500'	AL=3000'	AL=3500'	AL=4000'	AL=4500'	AL=5000'	AL=6000'	AL=7000'	AL=8000'	AL=9000'	AL=10000'	AL=11000'	AL=12000'	AL=13000'
86		<=100	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	2600
114		<=100	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3000	2400	1800	
135		3000	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	2500	1700			
151		3300	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	2300	1400				
156		3300	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	1800	1000				
172		3500	3500	3500	3500	3500	3500	3500	3500	3500	3300	1600	600	<=100				
210	800	3500	3500	3500	3500	3500	3500	3500	1200	500	<=100	<=100	<=100					
211	800	3500	3500	3500	3500	3500	3500	3500	1200	500	<=100	<=100	<=100					
230	1300	3500	3500	3500	3500	3500	3500	1700	1000	<=100	<=100	<=100						
267	2200	3500	3500	3500	3500	3500	2300	1300	500	<=100	<=100	<=100						
285	2800	3500	3500	3500	3500	3500	2000	1000	<=100	<=100	<=100	<=100						
326	3500	3500	3500	3500	3500	2700	1500	400	<=100	<=100	<=100							
348	3500	3500	3500	3500	3500	2400	1200	<=100	<=100	<=100	<=100							
392	3500	3500	3500	3500	3500	1700	600	<=100	<=100	<=100								
430	3500	3500	3500	3500	3500	1300	<=100	<=100	<=100	<=100								
452	3500	3500	3500	3500	2800	1000	<=100	<=100	<=100	<=100								
522	3500	3500	3500	3200	1500	400	<=100	<=100	<=100	<=100								
525	3500	3500	3500	3200	1500	400	<=100	<=100	<=100	<=100								
560	3500	3500	3500	2700	1200	<=100	<=100	<=100	<=100									
630	3500	3500	3300	2100	700	<=100	<=100	<=100	<=100									
645	3500	3500	3200	2000	600	<=100	<=100	<=100	<=100									
686	3500	3500	2800	1700	300	<=100	<=100	<=100										
753	3500	3500	2400	1200	<=100	<=100	<=100	<=100										
790	3500	3500	2100	1000	<=100	<=100	<=100	<=100										
816	3500	3300	2000	800	<=100	<=100	<=100	<=100										
881	3500	2800	1700	600	<=100	<=100	<=100											
970	3500	2300	1300	300	<=100	<=100	<=100											
979	3500	2300	1300	300	<=100	<=100	<=100											

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Track Connections

Track connections for the PMD-4/4R and for terminations may be of the plug type, providing the plugs are

clean and bright, and that the rail holes are freshly drilled to prevent oxidation before insertion of the plug connector.

WARNING *Connecting a dummy load across a unidirectional Approach Track Circuit makes the approach appear to be bidirectional to the PMD-4/4R. When a dummy load is connected across the track, set the UNI/BI parameter for that approach to Bidirectional when the limited predict mode is used. Failure to comply with this specification may cause shorter or longer than requested warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

Track Bonds

The track must be bonded within the approach length of the PMD-4. All bonds should be less than 6 inches long and attached by thermite weld. When the PMD-4/4R is terminated with a narrow band shunt, bonding should be extended an additional 20% beyond the termination.

Terminating PMD-4/4R Approaches

All PMD-4/4R approaches must be terminated whether they are bidirectional, semi-bidirectional, or unidirectional.

WARNING *Termination shunts should be placed at a distance based on maximum train speed and requested warning time, plus 4 seconds. Failure to properly place termination shunts could result in short warning times. Short warning times could result in death or serious Reference SRAC2.*

WARNING *When computing maximum train speed values, both the maximum timetable speed and locomotive over speed tolerances must be considered. Failure to comply with this specification may cause shorter than requested warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

1. When installing termination shunts, all approach distance measurements are made from the termination shunt to the PMD-4/4R's nearest set of track wire connections at the crossing.

2. The termination shunt position should be determined by adding a minimum of 4 seconds to the desired warning time at the maximum train speed for the location.

3. Terminations may be hardwire, wideband, NBS (narrow band shunt), or FSS (Frequency Selectable Shunts) depending on if other signals are used on the Track.

4. Whenever possible, terminations should be physically located between the rails in order to minimize lead length.

5. Leads should be connected to the rails with plug connectors which are crimped correctly to the ends of the termination leads.

6. Excess lead wire should be removed before crimping the plug connector.

7. Terminations, if other than the hardwire type, should be buried in the ballast to a depth of at least 6 inches to prevent physical damage.

8. If desired, both the NBS (narrow band shunt) and wideband shunt units may be housed in the optional Model 385A-3 Junction Box and buried in the ballast. Termination leads should not exceed 1-foot when housed in the Junction Box.

Refer to the following chart for selecting the type of termination shunt required with existing signals on the rail.

Application	**Existing Track Signals**	**Type of Termination Shunt**s
Non-Signal Territory	No overlapping approaches	No. 9 AWG or larger stranded track wire (hardwire)
	When approaches overlap	NBS-1 or NBS-2 Narrow Band Shunt or FSS
Signal Territory - DC Track Circuits	No overlapping approaches	1134D-2 Wideband Shunt or 1134D-3, 1134D-4, and 1134D-5 Dual Wideband shunts
	When approaches overlap	NBS-1 or NBS-2 Narrow Band Shunt or FSS
DC Coded Track Circuits	all frequencies	NBS-1 or NBS-2 Narrow Band Shunt or FSS
AC Coded Track Circuits	Low current AC coded track circuit	NBS-1 or NBS-2 Narrow Band Shunt or FSS
	High current AC coded track circuit	NBS-2 or NBS-3 Narrow Band Shunt or FSS
	High current AC coded track circuit. Required for frequencies: 210, 211, 230, 267, and 285 Hz	NBS-3

Narrow Band Termination Shunts

WARNING *Using an NBS-1 or NBS-2 to bypass insulated joints may affect the linearity of the approach resulting in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

The Narrow Band shunt comes in three types that are applied in different applications.

NBS-1	Low impedance shunt used where adjacent frequency separation is not critical. Provides better shunting than either NBS-2 or NBS-3.
NBS-2	High impedance shunt used where several close frequencies are overlapping. Provides less loading of adjacent crossings approaches.
NBS-3	Must be used in applications where high current AC coded cab signal is present. Only available in 210, 211, 230, 267 and 285 Hz.

Guidelines for Selecting Overlapping Frequencies When Using the NBS-1

WARNING *The Guidelines For Selecting Frequencies Used With An NBS-1 must be strictly followed to prevent excessive loading of PMD-4/PMD-4R approaches and short warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

Frequencies that can not be overlapped in any part of the approach
Frequencies that can not be overlapped in the first two-thirds of the approach from the
Frequencies that can not be overlapped in the first third of the approach from the

Freq	86	114	135	151	156	172	210	211	230	267	285	326	348	392	430	452	522	525	560	630	645	686	753	790	816	881	970	979
86	86																											
114		114																										
135			135																									
151				151																								
156					156																							
172						172																						
210							210																					
211								211																				
230									230																			
267										267																		
285											285																	
326												326																
348													348															
392														392														
430															430													
452																452												
522																	522											
525																		525										
560																			560									
630																				630								
645																					645							
686																						686						
753																							753					
790																								790				
816																									816			
881																										881		
970																											970	
979																												979

Guidelines for Selecting Overlapping Frequencies When Using the NBS-2

Frequencies that can not be overlapped in any part of the approach
Frequencies that can not be overlapped in the first two-thirds of the approach from the
Frequencies that can not be overlapped in the first third of the approach from the

Freq	86	114	135	151	156	172	210	211	230	267	285	326	348	392	430	452	522	525	560	630	645	686	753	790	816	881	970	979
86	86																											
114		114																										
135			135																									
151				151																								
156					156																							
172						172																						
210							210																					
211								211																				
230									230																			
267										267																		
285											285																	
326												326																
348													348															
392														392														
430															430													
452																452												
522																	522											
525																		525										
560																			560									
630																				630								
645																					645							
686																						686						
753																							753					
790																								790				
816																									816			
881																										881		
970																											970	
979																												979

FSS (Frequency Selectable Shunts)

WARNING *Inadvertent changes in frequency selection on a Frequency Selectable Shunt (FSS) could negate broken rail detection or shorten overlapping approaches. Follow the procedures for frequency selection and remove all unused nuts from the FSS. Loss of broken rail detection or shortened approaches could cause death or serious injury. Reference SRAC2.*

WARNING *Incorrect frequency selection on a Frequency Selectable Shunt (FSS) could negate broken rail detection or shorten overlapping approaches. Access to the shunt must be restricted to authorized personnel, either by burial in the track ballast, or by securing the shunt in a suitable enclosure. Loss of broken rail detection or shortened approaches could cause death or serious injury. Reference SRAC2.*

FSS models FSS-1 and FSS-2 are frequency adjustable narrow band shunts used to terminate an approach of a motion detector or constant warning system. The FSS is available in two configurations:

- FSS-1 low impedance, similar to a NBS-1, minimum 5 ohm reactive inductance.
- FSS-2 high impedance, similar to a NBS-2, minimum 10 ohm reactive inductance.

FSS units and the frequencies available for each model are listed in the following table.

FSS model	**Frequency range**	**May be substituted for :**
FSS-1A	86, 114, 151, 210, and 267 Hz	NBS-1
FSS-1B	267, 326, 392, 452, 522, and 560 Hz	
FSS-1/2C	630, 686, 753, 816, 881, and 979 Hz	NBS-1 or NBS-2
FSS-1D	86, 114, 156, 172, and 211 Hz	NBS-1
FSS-1E	211, 285, 348, 430, and 525 Hz	
FSS-1/2F	430, 525, 645, 790, and 970 Hz	NBS-1 or NBS-2
FSS-2A	86, 114, 151, 210, and 267 Hz	NBS-2
FSS-2B	267, 326, 392, 452, 522, and 560 Hz	
FSS-2D	86, 114, 156, 172, and 211 Hz	
FSS-2E	211, 285, 348, 430, and 525 Hz	

When applied to GETSGS crossing systems, FSS-1s and FSS-2s may be used anywhere an NBS-1 or NBS- 2, respectively, would be applied.

WARNING *Incorrect frequency selection on a Frequency Selectable Shunt (FSS) could negate broken rail detection or shorten overlapping approaches. Access to the shunt must be restricted to authorized personnel, either by burial in the track ballast, or by securing the shunt in a suitable enclosure. Loss of broken rail detection and shorten approaches could cause death or serious injury. Reference SRAC2.*

Setting the Operating Frequency

1. Remove the end cap from the FSS (Frequency Selectable Shunt).

2. When using a dummy load to balance unequal approaches caused by un-bypassed insulated joints, follow these additional steps:

   - Remove the link between the two terminals marked LOAD.

   - Connect the load coil between these two terminals.

3. Remove all nuts from the frequency selection terminals.

4. Install a gold nut on all appropriately marked frequency selection terminals. Install a clamp nut over the gold nuts to secure them.

WARNING *Inadvertent changes in frequency selection on a Frequency Selectable Shunt (FSS) could negate broken rail detection or shorten overlapping approaches. Follow the procedures for frequency selection and remove all unused nuts from the FSS. Loss of broken rail detection or shortened approaches could cause death or serious injury. Reference SRAC2.*

5. Connect the two track leads across the rail.

6. Replace the FSS end cap, and follow these additional steps:

   - Before tightening the end cap retaining nut, set the frequency marker to indicate the selected frequency.
   - Torque the end cap retaining nut to a minimum of 10 to 12 foot-pounds.

7. Secure the FSS by either burying the FSS in the track ballast or installing the FSS in a junction box or inside track-side housing.

8. Follow re-test procedures in *Chapter 9 - Re-Test Guide* of this manual to ensure proper crossing warning system operation.

Wideband Termination Shunts

Wideband termination shunts are used in applications with steady DC track circuits with no overlapping crossing approaches. Wideband shunt/Couplers are supplied in four different configurations (Figure X-X). When using a wideband as a termination shunt the 1134D-2 single wideband will work or one of the dual widebands can be used for redundancy. All models are designed for direct burial. Bury the wideband shunt in the ballast between the rails. Excess wire length must be removed before crimping to plug connectors.

If desired, the Model 1134D-2 Single Wideband shunt/Coupler may be housed in a Model 385A-3 Junction Box and buried in the ballast.

Bypassing Insulated Joints

WARNING *Do not couple the set of insulated joints at the location where a PMD-4/4R is connected in a unidirectional application. This set of insulated joints makes the approach track circuit itself unidirectional. Coupling this set of insulated joints would allow the track beyond the joints to affect the impedance seen by the PMD-4/4R. The change in track impedance could result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Using an NBS-1 or NBS-2 to bypass insulated joints may affect the linearity of the approach resulting in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

CAUTION Do not couple insulated joints in high current AC applications as this may cause erratic operation of the PMD-4/4R.

The PMD-4/4R must "see" the entire approach as continuous. If there are any insulated joints within the approach, the PMD-4/4R requires joint couplers to bypass them.

The type of bypass selected depends upon the type of signal circuit in the approach. Two types of insulated joint bypasses may be used:

1. The Wideband Joint (or Shunt) Coupler.

2. The TJC (Tunable Joint Coupler). When the PMD-4/4R is applied in limited predict mode, refer to the "Minimum Distance to Joints When Coupled with TJCs" table on page X-X, for more information.

Joint Couplers

Joint Couplers should be mounted near the insulated joint. Whenever possible, joint couplers should be mounted within 3 feet of the insulated joints they are bypassing. However, when necessary, Tunable Joint Couplers (TJCs) may be mounted away from the Track provided the following criteria are met:

1. Connect all four TJC track wires to the rail. (Multiple TJCs at a set of insulated joints may be connected to the rail through common track wires.)

2. The maximum total TJC track wire length is 35 feet (11m).

3. The additional track wire added to the TJC's normal 10-foot track wire length must be No. 6 AWG minimum.

There is one potential side effect to adding additional track wire to TJCs. A decreasing Phase Fault condition may occur on the approach of a train. If a decreasing Phase Fault condition occurs in relationship to TJC replacement, the only solution is to reduce the track wire length by moving the TJCs nearer to the track.

The types of mounting choices available depend on the type of joint coupler selected (TJC-1A or wideband). The TJC-1A joint coupler may be housed in a Ballast Mount Hardware Kit or buried directly in the ballast. The TJC-1A may also be mounted in the ballast between the ties and covered with a protective steel plate bolted to the ties. The TJC-1A is supplied with dual parallel leads. Make sure that the leads remain matched when connected to the rail to prevent shorting the joint. Excess wire length must be removed before crimping the leads to plug connectors.

Wideband joint couplers are supplied in four different configurations. All models are designed for direct burial. Bury the joint couplers in ballast between the rails or outside the Track within 3 feet of the joint. Excess wire length must be removed before crimping to plug connectors.

If desired, the Model 1134D-2 Single Wideband Joint Coupler may be housed in a Model 385A-3 Junction Box and buried in the ballast. The Wideband Shunt/Coupler Wiring Configurations are shown in Figure X-X below.

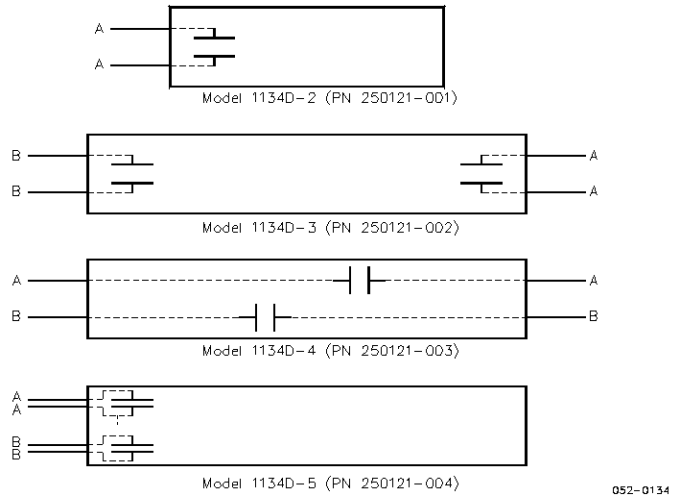

Figure X-X

Joint Coupler Applications		
Application	**Existing Track Signals**	**Type of Insulated Joint Coupler**
Non-Signal Territory	without audio frequency overlap	Does not apply
	with audio frequency overlap	Does not apply

Signal Territory - DC Track Circuits	DC track circuits on one or both sides of joints with or without out audio frequency overlap	1134D-2 Single Wideband or 1134D-3/4/5 Dual Wideband
DC Coded Track	all frequencies, but with DC coded track on one or both sides of insulated joints.	TJC-1A
AC Coded Track Circuits	low current AC coded track circuit with AC coded track on one or both sides to the joint	TJC-2/Cab
	high current AC coded track circuit	Do not couple, use unidirectional units to remotely detect trains

Non-Coded DC Track Circuits

Insulated joints should be coupled with the Model 1134D-2 Single Wideband Joint Coupler in non-coded DC track circuits.

Do not bypass more than:

Four sets of insulated joints per approach for frequencies of 86 Hz thru 135 Hz.

Five sets of insulated joints per approach for frequencies of 151 Hz and higher.

Use a Dual Wideband Joint Coupler when they are located:

- In the first 50 percent of the approach from the crossing for PMD-4/4R frequencies 86 Hz through 135 Hz.
- Within the first 1/3 of the approach from the crossing for PMD-4/4R frequencies 151 Hz through 392 Hz.

The Single Wideband Joint Coupler 1134D-2 is permissible on all frequencies when not in violation of the above.

The Dual Wideband Joint Coupler is available in three versions. The only physical difference between them is how the wires exit the coupler.

Coded DC, Coded AC, and Non-Coded AC Track Circuits

CAUTION Do not couple insulated joints in high current AC applications as this may cause erratic operation of the PMD-4/4R.

When bypassing insulated joints in low current AC applications, the TJC-2/CAB can be used if the following requirements are met:

The PMD-4/4R can have a maximum of 2 sets of joints bypassed with TJCs within each approach of a bidirectional application.

Unidirectional PMD-4/4R applications can have no more than 2 sets of joints bypassed with TJCs.

Limited Predict Mode

When the PMD-4/4R is used in limited predict mode, there is a minimum distance from the PMD-4/4R track wires that joints can be bypassed with TJCs. Refer to the "Minimum Distance To Joints When Coupled With TJCs" table on the next page for the minimum distances for each frequency.

The TJC-2/CAB may be buried or is available with tie mount hardware. The TJC-2/CAB can be installed in DC Coded Track circuits where vibration is a problem.

Tunable Joint Couplers			
Coupler	**Part Number**	**Track Circuit**	**Mounting**
TJC-1A Tunable Joint Coupler	250491-*	Coded-DC	Direct Burial
TJC-2A Tunable Joint Coupler	300187-*	Coded-DC	Ballast Mount
TJC-3A Tunable Joint Coupler	300188-*	Coded-DC	Tie Mount (Low Vibration Locations Only)
TJC-2/CAB	250376-*	Coded or Non-Coded AC	Direct Burial
TJC-2/CAB	300293-*	Coded or Non-Coded AC	Tie Mount

* = Add frequency from table “Minimum Distance to Joints When Coupled with TJCs”

Minimum Distance to Joints When Coupled with TJCs (Limited predict Mode Only)

The following chart shows the minimum distance to couple with Tuned Joint Couplers when the PMD-4/4R is applied in limited predict mode. When the PMD-4/4R is applied in motion detect mode only, TJCs can be applied anywhere in the approach.

Frequency	Minimum Distance to First Set of Joints	Minimum Distance to Second Set of Joints
86 Hz	5500(1676)	7500 (2286)
114 Hz	3000 (914)	4300 (1311)
135 Hz	2215 (675)	2927 (892)
151 Hz	2200 (671)	3000 (914)
156 Hz	2190 (668)	3010 (918)
172 Hz	2000 (610)	2730 (832)
210 Hz	1650 (503	2200 (671)
211 Hz	1650 (503)	2200 (671)
230 Hz	1577 (481)	2123 (647)
267 Hz	1300 (396)	1800 (549)
285 Hz	1240 (378)	1700 (518)
326 Hz	1100 (335)	1500 (457)
348 Hz	1020 (311)	1420 (433)
392 Hz	900 (274)	1300 (396)
430 Hz	820 (250)	1230 (375)
452 Hz	800 (244)	1200 (366)
522 Hz	725 (221)	1100 (335)
525 Hz	720 (219)	1095 (334)
560 Hz	700 (213)	1060 (323)
630 Hz	650 (198)	1020 (311)
645 Hz	630 (192)	1010 (308)
686 Hz	620 (189)	1000 (305)
753 Hz	600 (183)	950 (290)
790 Hz	560 (171)	920 (280)
816 Hz	550 (168)	900 (274)
881 Hz	500 (152)	850 (259)
970 Hz	455 (139)	805 (248)
979 Hz	450 (137)	800 (244)

[1] Distance applies to joints located on the same side of the crossing
[2] Distance is measured in feet.
[3] Distance in meters ( ).

Approach Frequency Selection

WARNING *When an Approach Track Circuit Frequency Selection parameter is changed, the PMD-4/4R defaults the associated Lumped Impedance Adjustment, Transmitter Check Adjustment, Ballast Compensation, Phase Compensation and Approach Transmitter Gain parameters to their Non-Corrupt Default values. Failing to verify and properly adjust all of these parameters before placing/returning the PMD-4/4R into service could result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Incorrectly setting the Approach Track Frequency Selection parameter could result in erratic operation of the crossing warning system. Erratic Operation could result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

The PMD-4/4R system allows the approach track transmitter/receiver frequency to be set, in the field, from a list of standard frequencies.

If the Approach Track Circuit is set for Master Mode and the Approach Track Circuit frequency is set to a frequency other than zero, the associated Approach Track Circuit transmitter and receiver will operate at the selected frequency.

If the Approach Track Circuit is set for Slave Mode and the Approach Track Circuit frequency is set to a frequency other than zero, the PMD-4/4R System will check to make sure the frequency present at the slave input is equal to the frequency selected before allowing Approach Track Circuit transmitter and receiver operation.

If the frequency selected is zero, the associated Approach Track Circuit transmitter and receiver will be “disabled” and the associated “MDR” statuses will be set “False” (as if a train has been detected).

If the Approach Track Circuit Frequency is not fixed by the application, it may be changed in the field via the display or Web GUI. Refer to the following tables to determine the frequencies for Bi-directional and Uni-directional applications. See the Display Navigation section within this manual for details on this user interface.

Frequency Selection Guidelines for Bi-directional Approaches

The following table is intended as a guideline to show the minimum and maximum approach lengths for a Bi-directional PMD-4/4R with a ballast of 2 Ohms per 1,000 feet (305m) and up to 30 Ohms per 1,000 feet (305m) of Track. Distances are for one approach in a bidirectional application.

FREQUENCY SELECTION GUIDELINE BI-DIRECTIONAL

	2Ω BALLAST		4Ω BALLAST		6Ω BALLAST		8Ω BALLAST		10Ω BALLAST		15Ω BALLAST		20Ω BALLAST		30Ω BALLAST	
	MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET	
FREQ	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
86	720	5000	720	7500	720	8700	720	10100	720	11200	720	13800	720	15900	720	19500
114	615	4250	615	6000	615	7400	615	8500	615	9500	615	11700	615	13500	615	16500
135	584	3938	584	5546	584	6700	584	7700	584	8700	584	10600	584	12200	584	15000
151	560	3700	560	5200	560	6300	560	7300	560	8100	560	10000	560	11500	560	14100
156	550	3675	550	5150	550	6200	550	7100	550	8000	550	9800	550	11300	550	13800
172	535	3550	535	4900	535	5900	535	6800	535	7600	535	9300	535	10700	535	13100
210	485	3100	485	4400	485	5300	485	6100	485	6800	485	8300	485	9600	485	11700
211	485	3100	485	4400	485	5200	485	6100	485	6800	485	8300	485	9600	485	11700
230	470	2998	470	4264	470	5000	470	5800	470	6500	470	7900	470	9100	470	11200
267	440	2800	440	4000	440	4600	440	5300	440	6000	440	7300	440	8400	440	10300
285	425	2700	425	3850	425	4500	425	5200	425	5800	425	7100	425	8100	425	10000
326	400	2500	400	3550	400	4200	400	4800	400	5400	400	6600	400	7600	400	9300
348	380	2425	380	3450	380	4000	380	4600	380	5200	380	6300	380	7300	380	9000
392	360	2300	360	3250	360	3800	360	4400	360	4900	360	6000	360	6900	360	8400
430	340	2200	340	3100	340	3600	340	4200	340	4600	340	5700	340	6600	340	8000
452	330	2150	330	3050	330	3500	330	4000	330	4500	330	5500	330	6400	330	7800
522	315	2000	315	2850	315	3300	315	3800	315	4200	315	5100	315	5900	315	7300
525	315	2000	315	2850	315	3200	315	3700	315	4200	315	5100	315	5900	315	7200
560	305	1925	305	2700	305	3100	305	3600	305	4000	305	5000	305	5700	305	7000
630	290	1800	290	2550	290	3000	290	3400	290	3800	290	4700	290	5400	290	6600
645	290	1770	290	2500	290	2900	290	3400	290	3800	290	4600	290	5300	290	6500
686	275	1750	275	2450	275	2800	275	3300	275	3600	275	4500	275	5200	275	6300
753	265	1675	265	2350	265	2700	265	3100	265	3500	265	4300	265	4900	265	6000
790	260	1630	260	2300	260	2600	260	3000	260	3400	260	4200	260	4800	260	5900
816	255	1600	255	2250	255	2600	255	3000	255	3300	255	4100	255	4700	255	5800
881	250	1550	250	2200	250	2500	250	2900	250	3200	250	3900	250	4500	250	5500
970	240	1455	240	2050	240	2400	240	2700	240	3100	240	3700	240	4300	240	5300
979	240	1450	240	2050	240	2400	240	2700	240	3000	240	3700	240	4300	240	5200

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Frequency Selection Guidelines For Unidirectional Approaches

Refer to the following table for guidelines in determining the minimum and maximum approach length distances that can be used in a unidirectional application with ballast of 2 Ohms per 1,000 feet and up to 30 Ohms per 1,000 feet of Track.

A PMD-4/4R used in a unidirectional application does not have as great an effective monitoring distance as a PMD-4/4R used in a bi-directional application.

WARNING *Connecting a dummy load across the Track makes a PMD-4/4R (used in a unidirectional application) function as a bidirectional unit. This requires making absolutely certain that when the PMD-4/4R is used in the limited predict mode, that the "Uni/Bi" parameter is set to "Bi" when a dummy load is used. The "Uni/Bi" parameter should be set to "Uni" when no dummy load is used in a unidirectional application. Failure to comply with this specification may cause shorter or longer than requested warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

When a unidirectional approach must be longer than specified in the next table, a dummy load can be connected in series with the appropriate termination shunt and installed rail-to-rail at the insulated joints. If this method is used, refer to the previous table for bidirectional approaches.

FREQUENCY SELECTION GUIDELINE UNI-DIRECTIONAL

	20 BALLAST		40 BALLAST		60 BALLAST		80 BALLAST		100 BALLAST		150 BALLAST		200 BALLAST		300 BALLAST	
	MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET		MAX TRACK LENGTH IN FEET	
FREQ	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
86	720	3560	720	5000	720	6090	720	7070	720	7840	720	9660	720	11130	720	13650
114	615	2840	615	4000	615	5180	615	5950	615	6650	615	8190	615	9450	615	11550
135	584	2630	584	3699	584	4690	584	5390	584	6090	584	7420	584	8540	584	10500
151	560	2470	560	3470	560	4410	560	5110	560	5670	560	7000	560	8050	560	9870
156	550	2450	550	3450	550	4340	550	4970	550	5600	550	6860	550	7910	550	9660
172	535	2300	535	3300	535	4130	535	4760	535	5320	535	6510	535	7490	535	9170
210	485	2070	485	2930	485	3710	485	4270	485	4760	485	5810	485	6720	485	8190
211	485	2070	485	2930	485	3640	485	4270	485	4760	485	5810	485	6720	485	8190
230	470	2002	470	2842	470	3500	470	4060	470	4550	470	5530	470	6370	470	7840
267	440	1870	440	2670	440	3220	440	3710	440	4200	440	5110	440	5880	440	7210
285	425	1800	425	2550	425	3150	425	3640	425	4060	425	4970	425	5670	425	7000
326	400	1670	400	2370	400	2940	400	3360	400	3780	400	4620	400	5320	400	6510
348	380	1630	380	2300	380	2800	380	3220	380	3640	380	4410	380	5110	380	6300
392	360	1530	360	2170	360	2660	360	3080	360	3430	360	4200	360	4830	360	5880
430	340	1480	340	2100	340	2520	340	2940	340	3220	340	3990	340	4620	340	5600
452	330	1430	330	2030	330	2450	330	2800	330	3150	330	3850	330	4480	330	5460
522	315	1330	315	1900	315	2310	315	2660	315	2940	315	3570	315	4130	315	5110
525	315	1330	315	1900	315	2240	315	2590	315	2940	315	3570	315	4130	315	5040
560	305	1280	305	1800	305	2170	305	2520	305	2800	305	3500	305	3990	305	4900
630	290	1200	290	1700	290	2100	290	2380	290	2660	290	3290	290	3780	290	4620
645	290	1195	290	1660	290	2030	290	2380	290	2660	290	3220	290	3710	290	4550
686	275	1170	275	1630	275	1960	275	2310	275	2520	275	3150	275	3640	275	4410
753	265	1115	265	1570	265	1890	265	2170	265	2450	265	3010	265	3430	265	4200
790	260	1090	260	1510	260	1820	260	2100	260	2380	260	2940	260	3360	260	4130
816	255	1065	255	1500	255	1820	255	2100	255	2310	255	2870	255	3290	255	4060
881	250	1035	250	1465	250	1750	250	2030	250	2240	250	2730	250	3150	250	3850
970	240	970	240	1360	240	1680	240	1890	240	2170	240	2590	240	3010	240	3710
979	240	965	240	1365	240	1680	240	1890	240	2100	240	2590	240	3010	240	3640

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Lightning Protection

WARNING *Air gap arresters provide the only approved type of track surge protection. Use of other types of surge protection could result in short warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

Chassis

GE Transportation Systems Global Signaling recommends grounding the PMD-4/4R chassis to ensure compliance with FCC requirements.

Supply Battery

The PMD-4/4R system battery can be protected from lightning in 1 of 3 ways:

1. Using an MDSA panel (for system battery current of 0A-6A), or
2. Using an MDSA-1XS/-2XS panel (for system battery current of 0A-12A), or
3. By using discrete air gap arrestors and equalizers.

   Note: *If using discrete arrestors, connect them according to Figure X-X below with addition of an external 20A slo-blo fuse between the battery and arrestors.*

4. Protect the supply battery by installing an equalizer between positive and negative battery.
5. Install an air-gap arrestor from positive and negative battery to earth ground. The schematic diagram is shown in Figure X-X below.

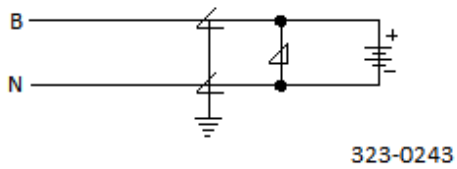

Figure X-X

Crossing Track Circuits Surge Protection

WARNING *Air gap arresters provide the only approved type of track surge protection. Use of other types of surge protection could result in short warning times. Short warning times could result in death or serious injury.*

Follow guidelines in this manual for wiring requirements to determine appropriate wire size**.** In most installations, B12, N12, and the TX +/- and RX +/- terminals are the only ones that need external surge protection. The MDSA provides suitable surge protection.

The MDSA-1/-1XS is configured to provide all the battery and track wire surge protection for PMD-4/4R crossing units. The MDSA wiring connections are shown in Figure X-X below.

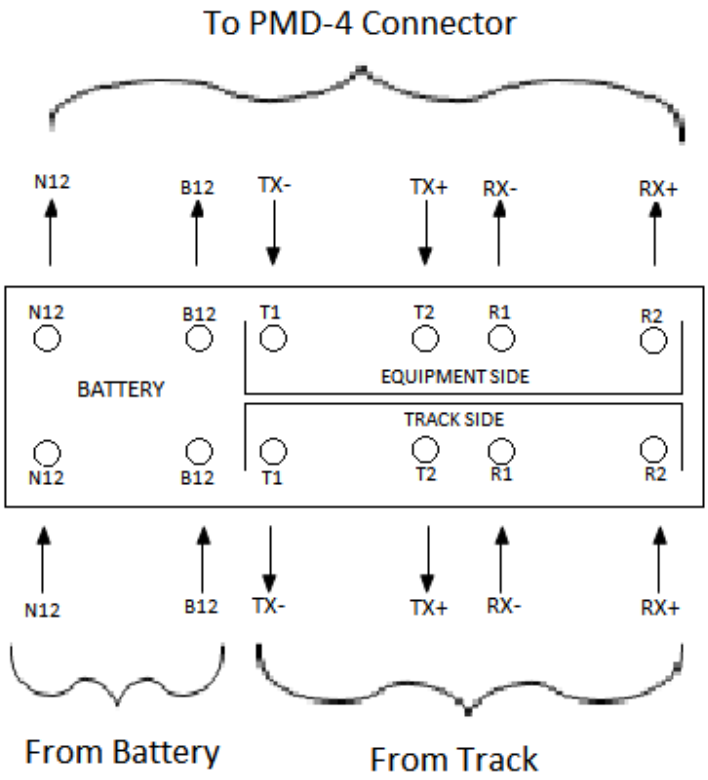

Figure X-X

Vital Inputs and Outputs Surge Protection

CAUTION Inputs and outputs that leave the signal case must be protected from lightning and surges by installing lightning arresters. All spare conductors in the cable must also be protected in the same fashion.

Any wires that go outside the signal cases are susceptible to electrical surges and must be protected with an air-gap arrester to earth ground. The Lightning Arrester Schematic for Vital Input or Output is shown in Figure X-X below.

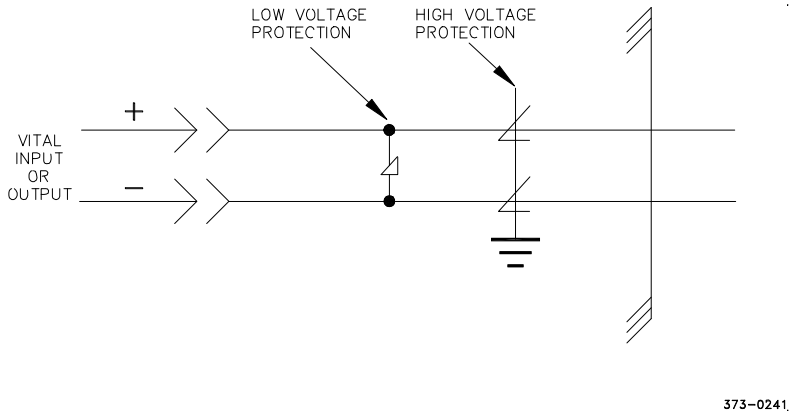

Figure X-X

Interconnect Panels

Interconnect panels can be used when retrofitting a crossing house that has legacy crossing control equipment. The interconnect panels are designed to minimize wiring changes with terminal layouts similar to the equipment that is being replaced. Wires can be transferred from the existing equipment terminal to the interconnect panel terminal one at a time for minimal wiring errors. A pre-wired cable will connect the panel to the PMD-4/4R Wago connector. The Interconnect panel are available to replace the PMD-1/1B, PMD-2, PMD-3/3R and HXP-1/1B/1C/2.

Insert drawings of the different panels with wiring diagrams

Peripheral Equipment

Part No.	Description
250016-001	1133A-2 60Hz Shunt
250016-002	1133A-2 180Hz Shunt
250249-XXX	*NBS-1 Narrow Band Shunt used with terminal housing (1ft. leads)
250250-XXX	*NBS-1 Narrow Band Shunt with 10ft. leads
250516-XXX	*NBS-2 Narrow Band Shunt used with terminal housing (1ft. leads)
250568-XXX	*NBS-2 Narrow Band Shunt with 10ft. leads
250896-J03	*NBS-3 Narrow Band Shunt with 10ft. leads (for 267 Hz applications in high current Cab only)
250141-001	5025A Track Battery Reactor
250158-1A	1180B Battery Reactor
225238-001	385A-3 Terminal Housing Pipe & Mounting Foot 20"
225238-003	385A-3 Terminal Housing Pipe & Mounting Foot 24"
250069-001	1186A-1 Dummy Load 1000 ft (305m).
250069-002	1186A-2 Dummy Load 2000 ft (610m).
250204-001C	MDSA-1 Motion Detector Surge Arrester (for one track) (0A-6A)
250675-000	MDSA-2 Motion Detector Surge Arrester (for two tracks) (0A-6A)
250204-100	MDSA-1XS Motion Detector Surge Arrester (for one track) (0A-12A)
250675-100	MDSA-2XS Motion Detector Surge Arrester (for two tracks) (0A-12A)
Frequency Selectable Shunts	
250849-000	FSS-1A, Frequency range (86Hz - 267Hz)
250849-001	FSS-1B, Frequency range (267Hz - 560Hz)
250849-002	FSS-1/2C, Frequency range (630Hz - 979Hz)
250849-003	FSS-1D, Frequency range (86Hz - 211Hz)
250849-004	FSS-1E, Frequency range (211Hz - 525Hz)
250849-005	FSS-1/2F, Frequency range (430Hz - 970Hz)
250850-000	FSS-2A, Frequency range (86Hz - 267Hz)
250850-001	FSS-2B, Frequency range (267Hz - 560Hz)
250850-002	FSS-2D, Frequency range (86Hz - 211Hz)
250850-003	FSS-2E, Frequency range (211Hz - 525Hz)
FSS Dummy Loads	
227032-000	FSS Load 250 ft (76m).
227032-001	FSS Load 500 ft (152m).
227032-002	FSS Load 750 ft (229m).
227032-003	FSS Load 1000 ft (305m).
227032-004	FSS Load 1250 ft (381m).
227032-005	FSS Load 1500 ft (457m).
227032-006	FSS Load 1750 ft (533m).

Part No.	Description
227032-007	FSS Load 2000 ft (610m).
227032-008	FSS Load 2250 ft (686m).
227032-009	FSS Load 2500 ft (762m).
227032-010	FSS Load 2750 ft (838m).
227032-011	FSS Load 3000 ft (914m).
227032-012	FSS Load 3250 ft (991m).
227032-013	FSS Load 3500 ft (1067m).
227032-014	FSS Load 3750 ft (1143m).
227032-015	FSS Load 4000 ft (1219m).
Interconnect Panels	
1000702-000	PMD-4/4R GENERIC INTERFACE PANEL
1000702-002	PMD-2 TO PMD-4 INTERFACE PANEL
1000702-003	PMD-3/3R TO PMD-4 INTERFACE PANEL
1000702-004	HXP-1/1B/1C/2 TO PMD-4 INTERFACE PANEL
1000702-005	PMD-1/1B TO PMD-4 INTERFACE PANEL
Equipment marked with an asterisk is frequency dependent. It must be of the same frequency as the equipment it is replacing. Unmarked equipment may be used as common maintenance stock for other PMD-4/4R systems regardless of frequency.	

Chapter 3 – Setup, Calibration, and Checkout using the Display and Keypad

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Chapter 3 – PMD-4/4R Setup, Calibration, and Checkout

WARNING *After initial setup and adjustment of PMD-4/4R parameter settings, adequate testing must be performed to detect any errors related to these configuration settings. The tests should be performed before the unit is placed into service and in accordance with standard railroad, FRA, and/or other regulatory agency rules. The tests should be performed by qualified personnel that have the knowledge to correctly and safely discharge the tests. Failure to adequately test the PMD-4/4R unit after the initial setup could result in death or serious injury. Reference SRAC2.*

WARNING *Railroad Configuration Management Procedures must ensure that all PMD-4/4R units are configured with the proper revisions of modules and firmware (both application and executive) and that updates are completed in a timely manner when made available by GE Transportation Systems Global Signaling. Operating with incorrect firmware may result in death or serious injury. Timely is defined as without undue delay per 49 CFR 236.1023(j). Reference SRAC2.*

WARNING *Railroad Configuration Management Procedures must ensure that the proper values are set for each crossing parameter, vital timer, vital configuration setting (vital soft switches), PTC Wireless Crossings vital parameters and vital remote parameter in their PMD-4/4R units. Incorrect settings may result in death or serious injury. Reference SRAC2.*

WARNING *Incorrect adjustment of RX could result in short, long, or continuous warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Incorrect placement of shunts during Island calibration could result in no warning while a train is occupying the island. Failing to detect trains in the island could result in death or serious injury. Reference SRAC2.*

Introduction

This section provides the maintainer with a step-by-step process for setup and adjustment of new or relocated PMD-4/4R equipment. The display menus for making adjustments are shown in this chapter. The same parameters may be set or adjusted using the Web GUI (see chapter X). This section addresses setup of the standard application programs shipped with the unit.

Application Programs

The PMD-4/4R is shipped from the factory with a standard application set. Each application will have a different chassis ID. There will be two applications pre-loaded onto the memory module connected on the side of the unit for each cabinet type. Refer to the following table for a list of the applications available for each cabinet type with a brief description.

PMD-4/4R Applications			
Cabinet Type	Application Name	Chassis ID	Description
PMD-4	pmd-4_md	1	Motion detector application for the non-redundant PMD-4 system. This application is capable of limited prediction when the optional selective function key is enabled.
	pmd-4_cw	2	Limited predictor application with advanced traffic preemption output for the non-redundant PMD-4 system. Requires the optional selective function key to enable the predict feature
PMD-4R	pmd-4r_md	3	Motion detector application for the redundant PMD-4R system. This application is capable of limited prediction when the optional selective function key is enabled.
	pmd-4r_cw	4	Limited predictor application with advanced traffic preemption output for the redundant PMD-4R system. Requires the optional selective function key to enable the predict feature

Input and Output descriptions for the standard application programs

The inputs and outputs on the standard application programs will vary depending on which program is selected. The following tables describe the functions of the inputs and outputs of each application program.

Application programs “pmd-4_md” and “pmd-4r_md” Input/output descriptions

INPUT Descriptions	
ISLI	The ISLI input that controls the island assignment in logic when the External island is selected. This input should be tied high to battery in remote applications. When applied back to back with a unit that encompasses the island, the ISLI input will be supplied by the island output from the PMD-4 with the island. This input is not used when the Internal Island is selected.
RSOI	The RSOI input controls the reverse switch override logic. When the RSOI is de-energized MDR1 (MDR output) will react immediately to a sudden shunt in the approach. When the RSOI is energized the sudden shunt override is in place to override a sudden shunt (trailing switch in the approach) for 4 seconds before reacting to motion.
AUXI1	The AUXI1input provides positive control over MDR1 (MDR output). When de-energized the MDR output will be de-energized. When energized the MDR output will be energized if not in detection.
AUXI2	The AUXI2 input is not used in logic but is a recorded variable that can be used as a recorder input for a GD, GP or POR input for logging purposes.
OUTPUT Descriptions	
MDR	The MDR output is the output for MDR1. This output is the motion detector output to start the crossing activation sequence. This output can be used to drive a crossing control relay or AUX Input on another unit. The MDR output can also be connected directly to a solid state crossing controller input.

ISLO	The ISLO output indicates the status of the island circuit when the internal island is selected. When the external island is selected the ISLO output will follow the ISLI input.
AXO1	The AXO1 output is used to indicate module health. This output is normally energized and will be de-energized when any internal module health statuses goes false. Note: This output will also be false if the VIO Input or output redundancy is compromised in the pmd-4r_md application.
AXO2	The AXO2 output is used to indicate when an approach or island is disabled. This output is normally energized and will be de-energized if an approach or island is disabled.

Application programs "pmd-4_cw" and "pmd-4r_cw" Input/output descriptions

INPUT Descriptions	
ISLI	The ISLI input that controls the island assignment in logic when the External island is selected. This input should be tied high to battery in remote applications. When applied back to back with a unit that encompasses the island, the ISLI input will be supplied by the island output from the PMD-4 with the island. This input is not used when the Internal Island is selected.
RSOI	The RSOI input controls the reverse switch override logic. When the RSOI is de-energized MDR2 (AXO1 output) will react immediately to a sudden shunt in the approach. When the RSOI is energized the sudden shunt override is in place to override a sudden shunt (trailing switch in the approach) for 4 seconds before reacting to motion.
AUXI1	The AUXI1input provides positive control over MDR1 (MDR output). When de-energized the MDR output will be de-energized. When energized the MDR output will be energized if not in detection.
AUXI2	The AUXI2input provides positive control over MDR2 (AXO1 output). When de-energized the AXO1 output will be de-energized. When energized the AXO1 output will be energized if not in detection.
OUTPUT Descriptions	
MDR	The MDR output is the output for MDR1. This output is the motion detector output to start the crossing activation sequence. This output can be used to drive a crossing control relay or AUX Input on another unit. The MDR output can also be connected directly to a solid state crossing controller input.
ISLO	The ISLO output indicates the status of the island circuit when the internal island is selected. When the external island is selected the ISLO output will follow the ISLI input.
AXO1	The AXO1 output is the output for MDR2. MDR2 is the advanced preemption MDR paired with MDR1 as a preempt pair. AXO1 will control the advanced traffic preempt relay used to start the advanced traffic preempt cycle.
AXO2	The AXO2 output is used to indicate when an approach or island is disabled. The AXO2 output is also used to indicate module health. This output is normally energized and will be de-energized if an approach or island is disabled or any of the internal module health statuses goes false. Note: This output will also be false if the VIO Input or output redundancy is compromised in the pmd-4r_cw application.

Local User Confirmation

A number of PMD-4/4R setup parameters are vital (safety critical). One mechanism utilized to secure these parameters is referred to as **Local User Confirmation**. The **Local User Confirmation** ensures that an actual user is physically present at the PMD-4/4R before an application program can be selected or any PMD-4/4R crossing setup parameter can be modified using the front panel display. Before a vital adjustment can be made, a three digit number will be displayed on the LCD display that needs to be entered om the keypad to confirm a local user. Local User Confirmation is canceled in two ways. First, it will automatically cancel, thirty minutes after the last keystroke on the keypad. Second, if Local Presence is granted using the Web GUI, and Local User Confirmation through the keypad is currently active, the Local User Confirmation is cancelled and Local Presence on the WebGUI is active. In the following figure X-X below, is a five digit confirmation code. To confirm, enter the number listed in the confirmation message and press the Enter button.

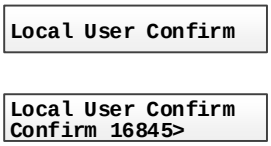

Figure X-X

Home Menu

The PMD-4/4R Home menu is shown in Figure X-X below.

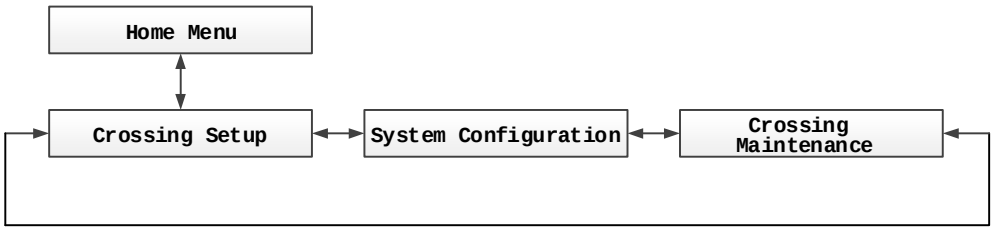

Figure X-X

System Configuration Menu

The System Configuration Menu is used to setup the following configuration options.

- Select the Application
- View Application Information
- View executive Information
- Set the date & Time
- Configure the Ethernet ports
- View and Change Vital Configuration software Switches
- View and Clear Alarms
- Activate Executive Version

The System configuration menu map is shown in Figure X-X below.

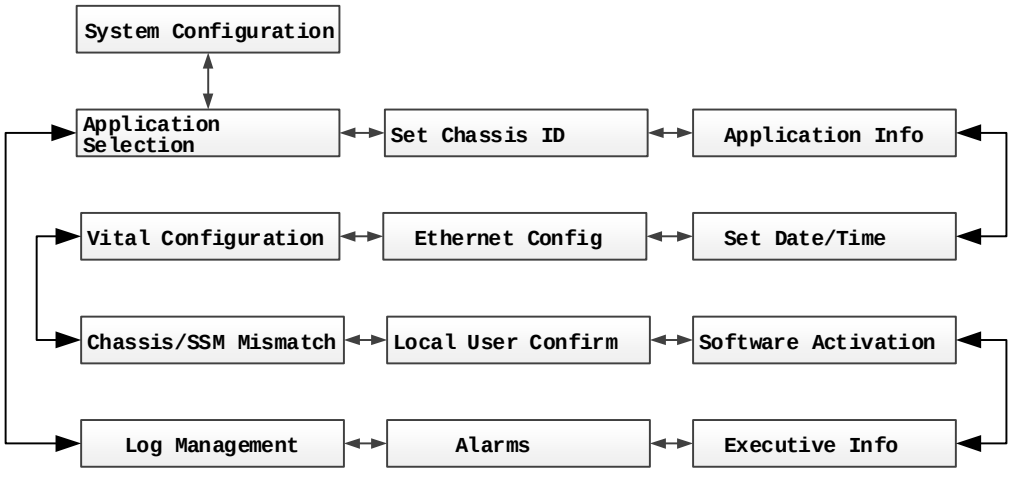

Figure X-X

Application Selection

The PMD-4/4R can store multiple, independent, application programs on the memory module. The user must select the exact application program for a particular location. Application Program selection information is stored on the PMD-4/4R SSM.

PMD-4/4R application programs can be selected via the front panel display or Web GUI in the system configuration menu.

Selecting the Application Using the Front Panel Display on initial installation

WARNING *When entering information on the display that requires confirmation, verify that the new value re-displayed by the system matches the intended value. Confirmation of an incorrect value could result in a less restrictive condition which could cause death or serious injury. Reference SRAC2.*

The PMD-4/4R Application Selection Menu is shown in Figure X-X below.

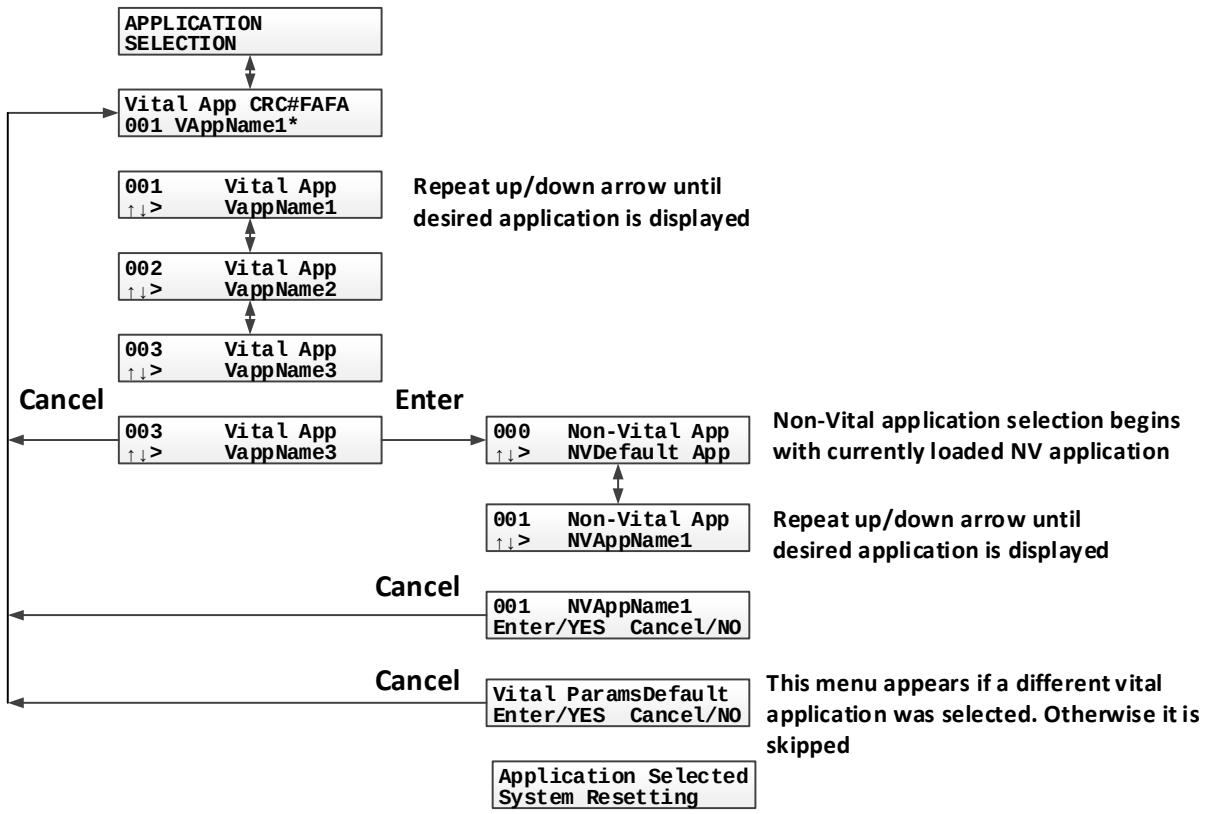

Figure X-X

Application Information

Each application program will have a unique checksum and CRC. Verify that the checksum and CRC match the application circuit plans. The Application Information Menu is shown in Figure X-X below.

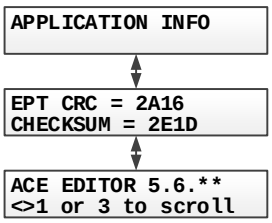

Figure X-X

Setting the Date & Time

The Date and Time are used to stamp events in the various PMD-4/4R logs. To set the PMD-4/4R Date and Time use the Date and Time Menu shown in Figure X-X below.

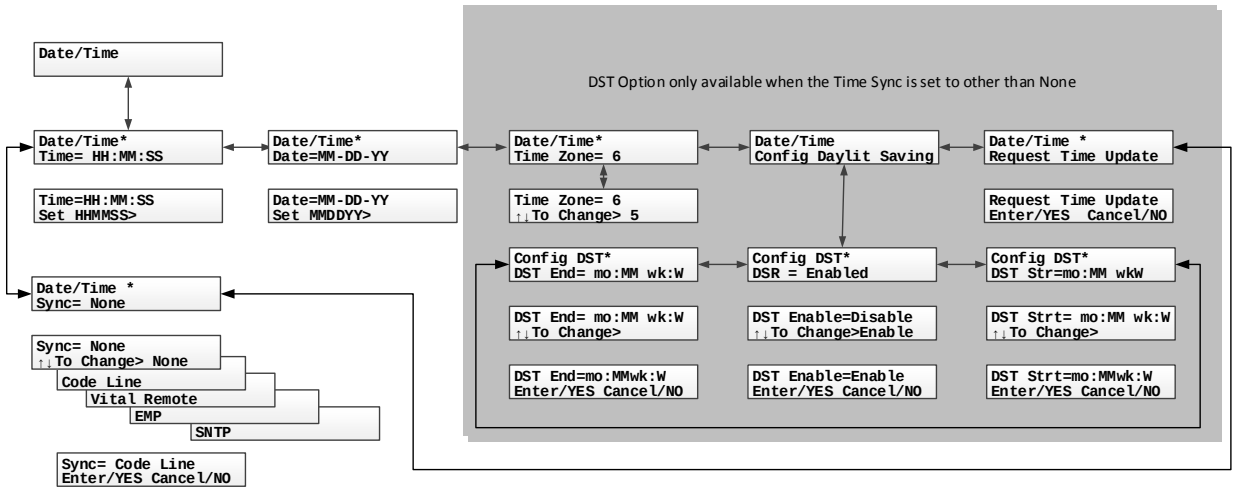

Figure X-X,

The Date/Time Menu allows access to menus for display and modification date and time options.

Time

The Time Menu provides the ability to display and set the current time.

Date

The Date Menu provides the ability to display and set the current date.

Time Zone

The Time Zone Menu provides the ability to display and set the local time zone reference used for adjusting incoming time references contained in Greenwich Mean Time (GMT) based ATCS time messages. Time zone 5 represents Eastern Standard Time (EST) and 8 represents Pacific Standard Time (PST)

Ethernet Configuration

The PMD-4/4R has two Ethernet ports available for setup and diagnostics. To change the Ethernet port settings using the keypad and display. The Ethernet Configuration menu is shown in Figure X-X below.

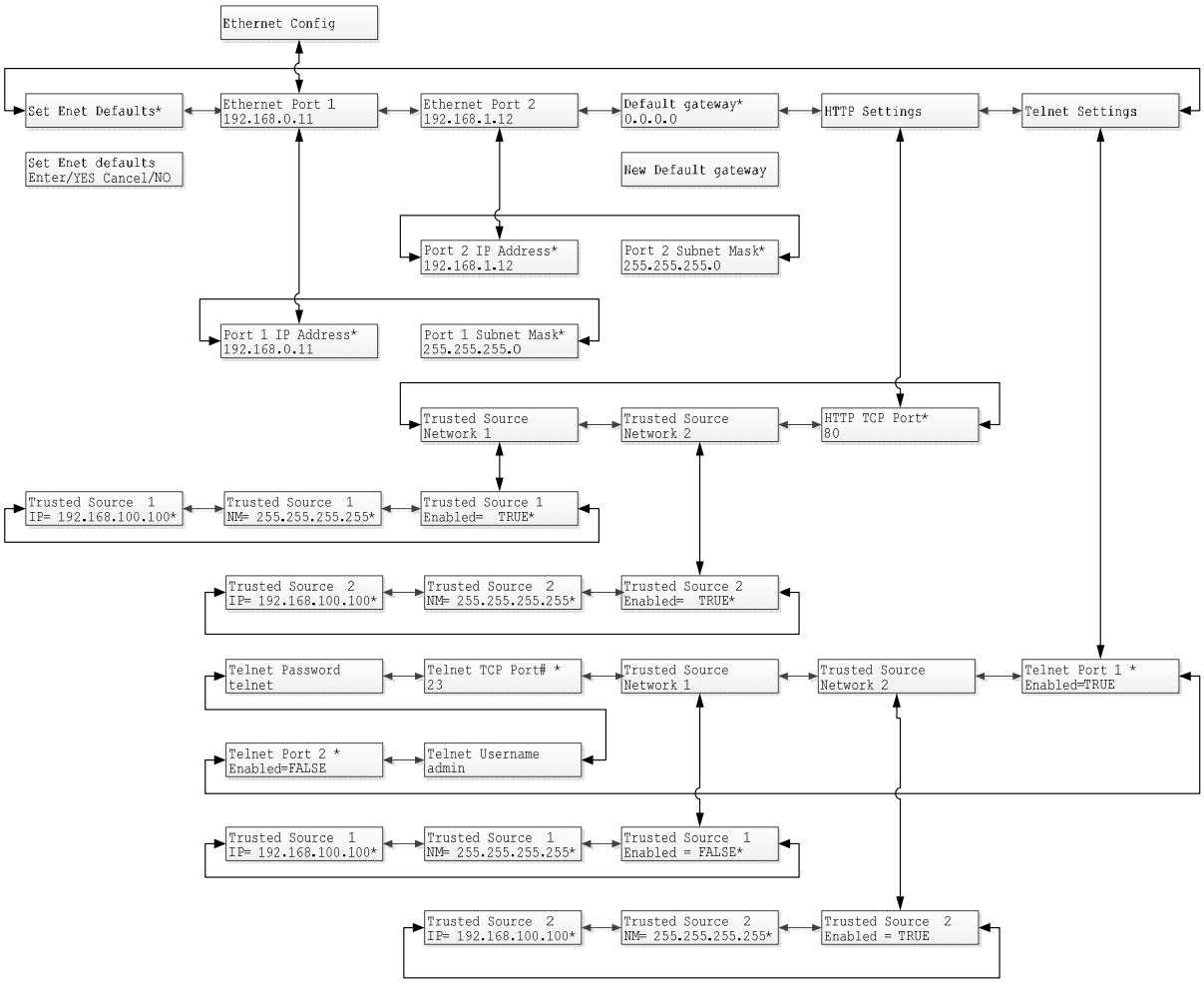

Figure X-X

Ethernet port configuration involves setting the following parameters:

- IP Address for Ethernet 1 and Ethernet 2
- Subnet Mask settings for Ethernet 1 and Ethernet 2
- Default Gateway address
- HTTP TCP Port Number for Web GUI access
- Trusted Sources Enabled / Disabled
- Trusted Source parameters (Trusted IP Network Address / Netmask)
- Telnet Enable/Disable
- Telnet Username and Password
- Telnet Port Number
- Telnet Trusted Source Parameters (Enable, Trusted IP Network Address / Netmask)
- Routing Table Entries

- Web GUI Inactivity Time-out

Parameter	Factory Default	Set Via	
		CDU	GUI
Ethernet 1 IP Address:	192.168.0.11		
Ethernet 1 Subnet Mask:	255.255.255.0		
Ethernet 1 DHCP Server	Enabled		
Ethernet 1 DHCP Server IP Pool Start	192.168.0.12		
Ethernet 1 DHCP Server IP Pool End	192.168.0.44		
Ethernet 1 DHCP Server Default Gateway	192.168.0.11		
Ethernet 2 IP Address:	192.168.1.12		
Ethernet 2 Subnet Mask:	255.255.255.0		
Ethernet 2 DHCP Server	Enabled		
Ethernet 2 DHCP Server IP Pool Start	192.168.1.13		
Ethernet 2 DHCP Server IP Pool End	192.168.1.45		
Ethernet 2 DHCP Server Default Gateway	192.168.1.12		
Default Gateway:	0.0.0.0 (No Default Gateway)		
Trusted Source / Network 1	Disabled, IP = 0.0.0.0, Netmask = 0.0.0.0		
Trusted Source / Network 2	Disabled, IP = 0.0.0.0, Netmask = 0.0.0.0		
Telnet Port 1	Disabled		
Telnet Port 2	Disabled		
Telnet Username	admin		
Telnet Password	telnet		
Telnet TCP Port	23		
Telnet Trusted Source 1	Disabled, IP=0.0.0.0, Netmask=0.0.0.0		
Telnet Trusted Source 2	Disabled, IP=0.0.0.0, Netmask=0.0.0.0		
Routing Table Entries	No Route Entries		
Web GUI Inactivity Time-out	60 minutes		

Vital Configuration (Vital Soft Switches)

There are a total of 32 vital configuration switches that can be configured for application specific operations. Refer to the setup plans for your application before setting these switches. If no Vital Configuration Switches are defined in the Application, this menu will not be shown. Note: The standard PMD-4/4R applications shipped with the unit do not use vital configuration switches. Use the vital configuration menu to set the vital configuration switches. The Vital Configuration menu is shown in Figure X-X below.

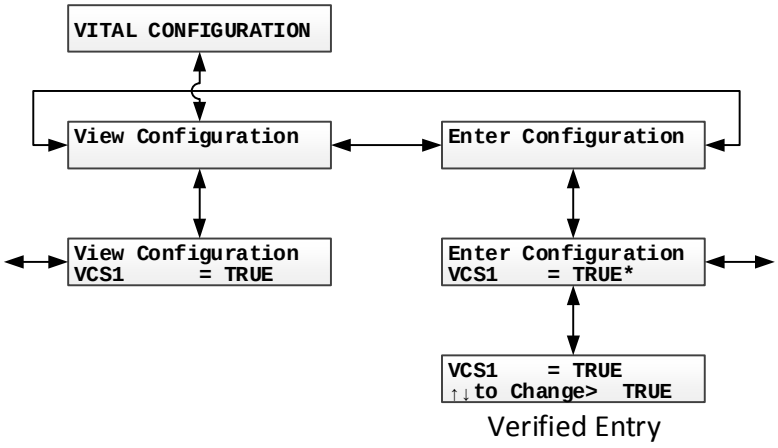

Figure X-X

Log Management Menu

Use the Log Management menu to view and configure the logs. The log management menu is shown in Figure X-X below.

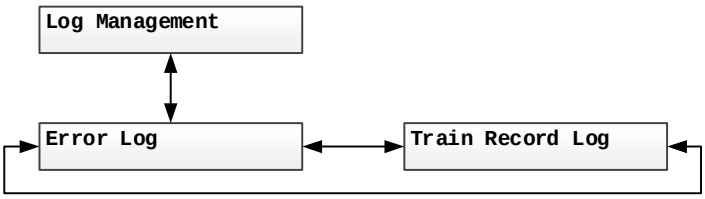

Figure X-X

Error Log Menu

The Error Log menu is shown in Figure X-X below.

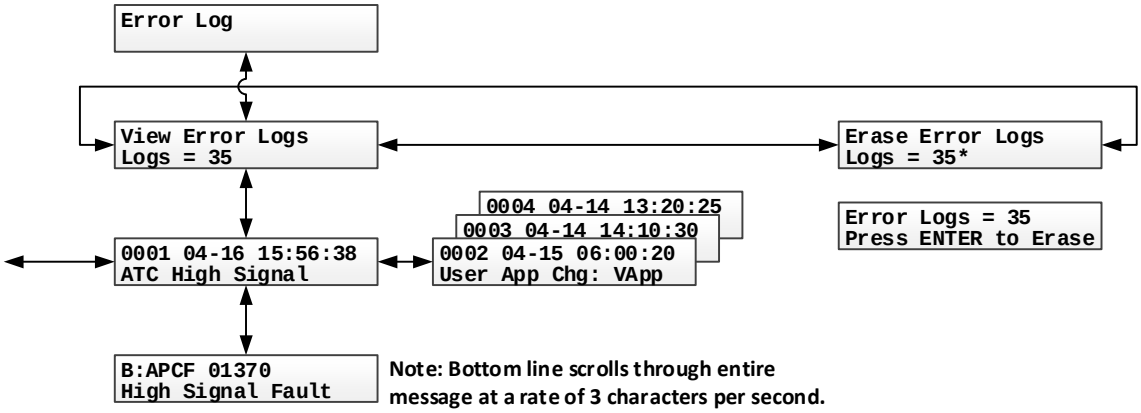

Figure X-X

Train Record Log Menu

The Train Record Log menu is shown in Figure X-X below.

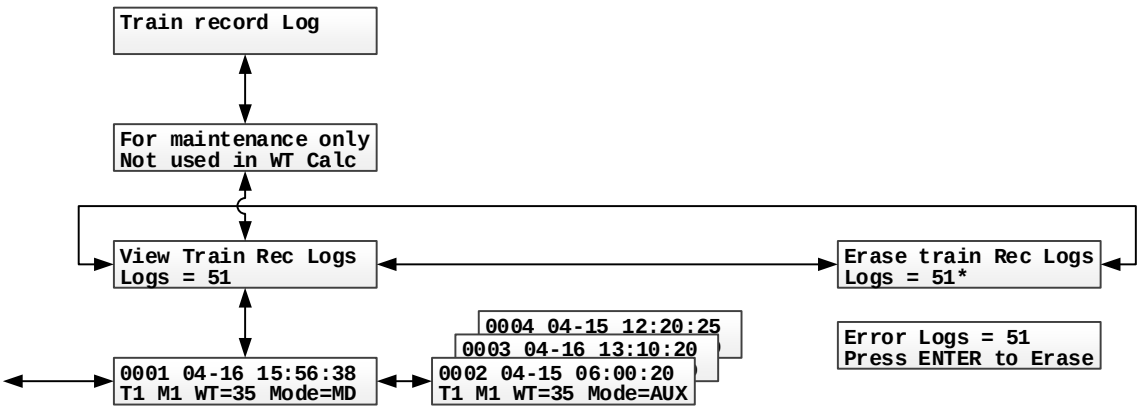

Figure X-X

Alarms

The System Alarms Menu provides the ability to view and clear system alarms. The Alarms menu is shown in Figure X-X below.

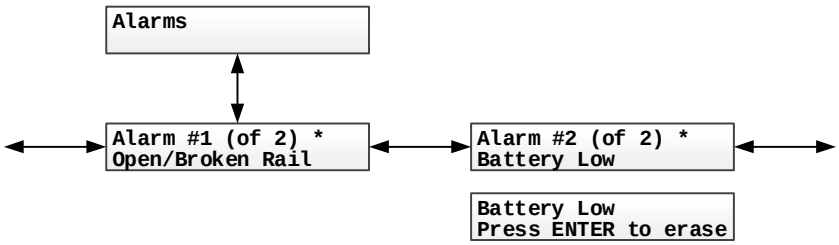

Figure X-X

Executive Information

The executive version and XTI DSP version can be viewed on the display. The Executive Information menu is shown in Figure X-X below.

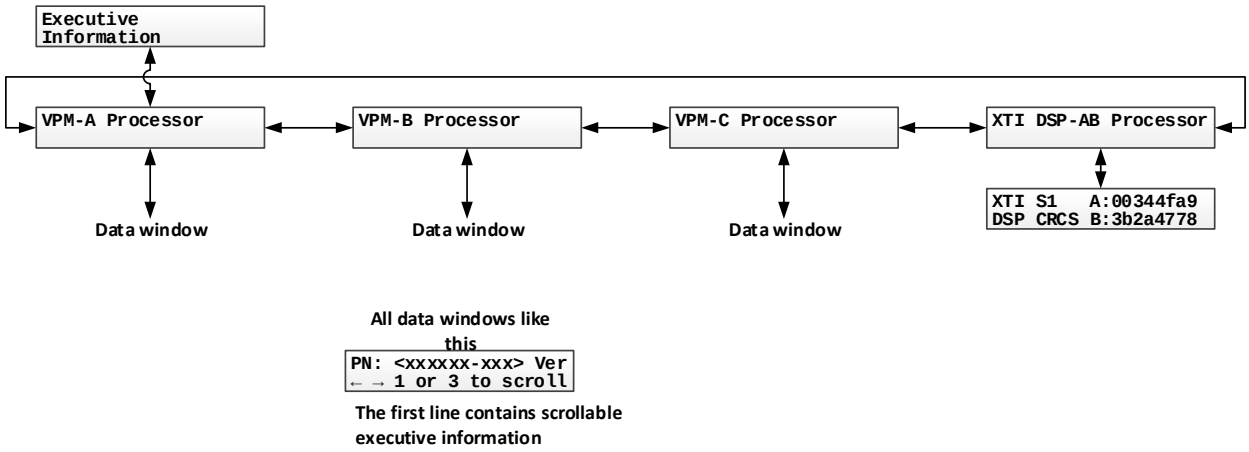

Figure X-X

Software Activation

The Software Activation menu allows a Maintainer to activate an Executive file that has been uploaded to the system. The Software Activation option must be used to enable the use of the new version of the Executive on the system. The Software Activation menu only appears when there is a file of that type that is available to activate. The Software Activation menu is shown in Figure X-X below.

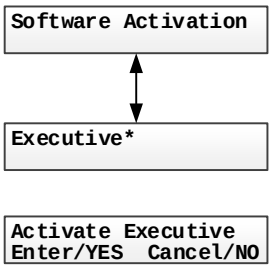

Figure X-X

PMD-4 Chassis ID/SSM Mismatch Menu

The Chassis ID/SSM Mismatch menu is shown in Figure X-X below.

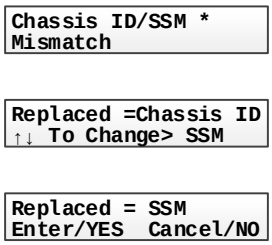

Figure X-X

Set Chassis ID Menu

The Chassis ID menu can be used to view or modify the chassis ID. The Chassis ID can be set to an 8 bit value from 0-254. The Chassis ID menu is shown in Figure X-X below.

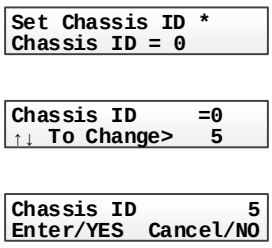

Figure X-X

Crossing Setup Menu

Setting up the PMD-4/4R using keypad and display will be accomplished in the Crossing Setup Menu. The Crossing Setup menu is shown in Figure X-X below.

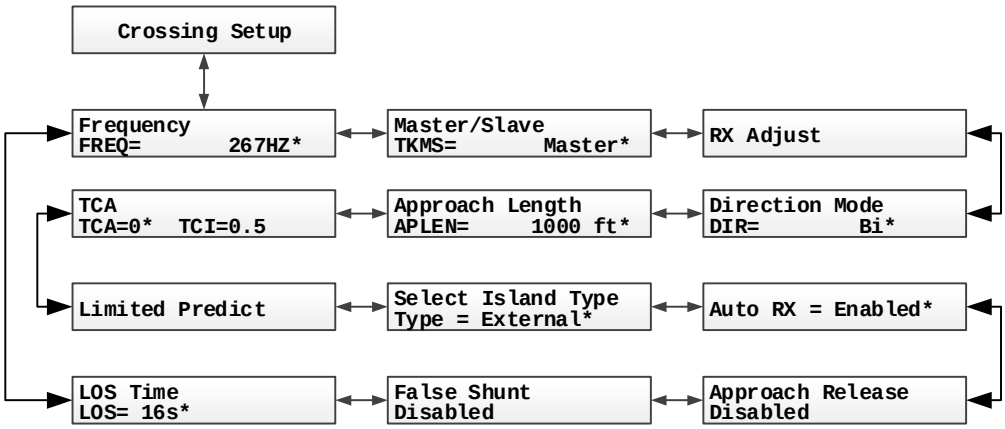

Figure X-X

Setting Crossing Parameters in the Field

All crossing parameters that are not fixed by the application program can be modified via the PMD-4/4R keypad and display or Web GUI. The value of the parameters changed via the keypad or Web GUI are stored in non-volatile memory on the PMD-4/4R memory module.

When an application program is selected and loaded, the vital crossing parameters are set to the default values defined in the application. Use program information listed on the circuit plans for the values to be used for the unit setup.

Note: *One exception to this rule is* ***Site ID****. The PMD-4/4R* ***Site ID*** *can only be set via the Web GUI.*

Approach Setup

WARNING *Incorrectly setting any of the Approach Track Circuit parameters could result in a shorter or longer than desired warning time. Short warning times could result in death or serious injury. Reference SRAC2.*

Refer to circuit plans or fill out a Grade Crossing Location Record to record all setup parameters for the location and keep these records with the PMD-4/4R unit. Following are the setup parameters for the PMD-4/4R

- Approach Track Frequency
- Approach Track Master/Slave
- Approach Track RX
- Approach Direction Mode
- Approach Length
- Transmitter Check Adjustment
- LOS (Loss of Shunt Time)
- False Shunt Detect Enable/Disable
- Approach Release Detect Enable/Disable
- Auto RX Enable/Disable
- Island Type
- Limited Predict

Approach Frequency Selection

WARNING *When an Approach Track Circuit Frequency Selection parameter is changed, the PMD-4/4R defaults the associated Lumped Impedance Adjustment, Transmitter Check Adjustment, Ballast Compensation, Phase Compensation and Approach Transmitter Gain parameters to their Non-Corrupt Default values. Failing to verify and properly adjust all of these parameters before placing/returning the PMD-4/4R into service could result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Incorrectly setting the Approach Track Frequency Selection parameter could result in erratic operation of the crossing warning system. Erratic Operation could result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

The PMD-4/4R system allows the approach track transmitter/receiver frequency to be set, in the field, to any one of a predefined list of frequencies. The frequency can be changed in the field via the keypad. The Frequency menu is shown in Figure X-X below.

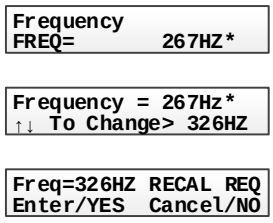

Figure X-X

Operating Frequencies					
86 Hz	172 Hz	285 Hz	452 Hz	645 Hz	881 Hz
114 Hz	210 Hz	326 Hz	522 Hz	686 Hz	970 Hz
135 Hz	211 Hz	348 Hz	525 Hz	753 Hz	979 Hz
151 Hz	230 Hz	392 Hz	560 Hz	790 Hz	
156 Hz	267 Hz	430 Hz	630 Hz	816 Hz	

Setting the Master/Slave Parameter

The Master/Slave Parameter is set for each individual approach track to synchronize approach frequencies. The PMD-4/4R can be synchronized with an XP4 or HXP-3. Master/Slave Synchronization is accomplished by connecting the MS + and MS- on the J3 connectors on one PMD-4/4R to the MS + and MS- J3 connectors to another PMD-4/4R, XP4 or HXP/PMD-3 with the same polarity meaning Unit1(M+) should connect to Unit2(M+) and so forth with the (M-)connections. Set one unit to "Master" with all other units connected by the MS+ and MS- terminals set to "Slave". Up to 11 Slave units can be attached to one Master. This parameter may be changed in the field via the front panel display. The Master/Slave menu is shown in Figure X-X below.

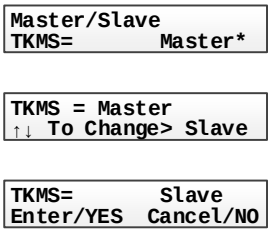

Figure X-X

Approach Calibration

WARNING *Incorrect adjustment of RX could result in short, long, or continuous warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

Approach Calibration

To calibrate the approach RX, select the RX Adjust menu to auto calibrate the unoccupied approach. Select the desired target RX (the target RX should nearly always be left set to 100), and the PMD-4/4R automatically adjusts the approach transmitter gain and the associated Normal/Short/Very Short parameter to produce the target RX. The user then acknowledges the successful calibration and the PMD-4/4R displays the new proposed transmitter gain value and resulting RX. The user then confirms the new values and calibration is complete for the approach track. The RX Adjust menu is shown in Figure X-X below.

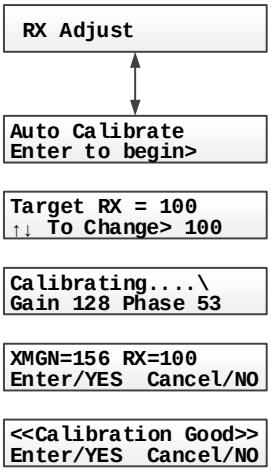

Figure X-X

WARNING *Incorrectly setting the UNI/BI parameter for an approach track circuit could result in short or longer than desired warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Connecting a dummy load across a unidirectional Approach Track Circuit makes the approach appear to be bidirectional to the PMD-4/4R. When a dummy load is connected across the track, set the UNI/BI parameter for that approach to Bidirectional. Failure to comply with this specification may cause shorter or longer than requested warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

Depending on the application, the PMD-4/4R may need an approach track circuit that looks both directions out from the crossing (bi-directional) or one that looks only one direction away from a set of insulated joints. The PMD-4/4R allows the approach track to be set for either unidirectional or bi-directional operation. The Directional Mode may be changed in the field via the display and keypad. The Direction Mode menu is shown in Figure X-X below.

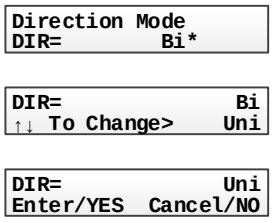

Figure X-X

Setting Approach Length

WARNING *Incorrectly setting the Approach Length parameter for an approach track circuit could result in short or longer than desired warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Approach length must be measured from the track wire connections on the termination side of the crossing island. Measuring from the center of the crossing may result in short warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *When an Approach Length parameter is changed for a particular approach track circuit, the PMD-4/4R defaults the associated Narrow Band Shunt Compensation parameter to its Non-Corrupt Default value. Failing to verify and properly adjust the Compensation parameter before placing/returning the PMD-4/4R to service could result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

The PMD-4/4R needs the length of the approach track to be set. The approach length can be set from 250 to 9999 ft. The Approach Length menu is shown in Figure X-X below.

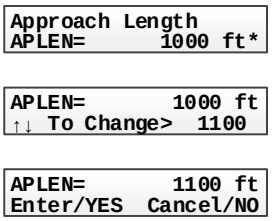

Figure X-X

Adjusting the Transmitter Check (TC) Value

WARNING *Before making any Transmitter Check parameter adjustments, verify that all rail connections provide a good low impedance contact. Inspect the Island and track wire connections. Any high impedance connections detected must be corrected before proceeding to prevent short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

The Transmitter Check Adjustment feature allows the PMD-4/4R System to detect high impedance in the transmitter and receiver track wires. If the impedance in the wires is too great, the PMD-4/4R System declares a fault condition.

The transmitter check adjustment allows the fault threshold to be adjusted to compensate for normal levels of impedance due to such things as long track wires. The PMD-4/4R allows the transmitter check to be adjusted for each individual approach track circuit.

Two parameters are shown on the DISPLAY, TCI and TCA. TCI represents the impedance of the track wires. The TCA value adjusts the transmitter check alarm threshold. The PMD-4/4R system will declare a fault condition when the TCI value equals the TCA value plus 7.

On initial installation adjust the TCA value to alarm at TCI plus 2.

Example: TCI = 4 Set TCA value at -1

The Transmitter Check value is changed in the field via the display and keypad. The TCA menu is shown in Figure X-X below.

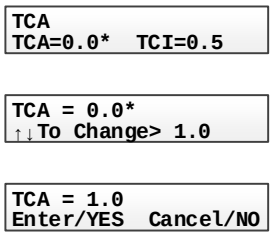

Figure X-X

Field Adjustment of TJCs (Tuned Joint Couplers) when designed for Limited Predict Mode

Use the following procedure to tune all TJCs in the approach. If no joints are coupled with TJCs, skip this step.

- TJCs are tuned by tightening and loosening combinations of "numbered" AAR gold-plated nuts located inside the housing.
- The tuning arrangement is designed so each successive terminal (1 through 5) provides twice the amount of change as the previous terminal(s).
- Terminal 2 provides twice as much change as terminal No. 1 and so on.
- TJCs are shipped from the factory with No. 5 terminal nut tightened down and the remaining terminal nuts backed off.

Use the following procedure to tune both TJCs at a set of insulated joints:

1. Start with the coupled insulated joints that are closest to the crossing and work outward.
2. Place a hardwire test shunt at Location A. Refer to Figure X-XX below for staggered joints or Figure X-X below for Non-Staggered joints.
3. Note the RX shown on the displayed.
4. Move the hardwire test shunt to Location B
5. Tune the TJC #1 to the same RX previously observed when the test shunt was at Location A. Refer to Figure X-XXX below to fine tune the TJC.
6. Move the hardwire test shunt to Location **C**.
7. Tune TJC #2 to the same RX originally observed with the test shunt at Location A.
8. Remove the test shunt
9. Observe the RX value on the DISPLAY and adjust the PMD-4 if the RX is not "100".
10. Move to the next set of coupled joints (if applicable).

Note: *When a terminal is not used for tuning, back off the locking nut and gold-plated nut until they are both beyond the nylon friction thread insert. The nylon insert prevents the nut from loosening and possibly de-tuning the TJC.*

11. Repeat this procedure for additional tracks if applicable.

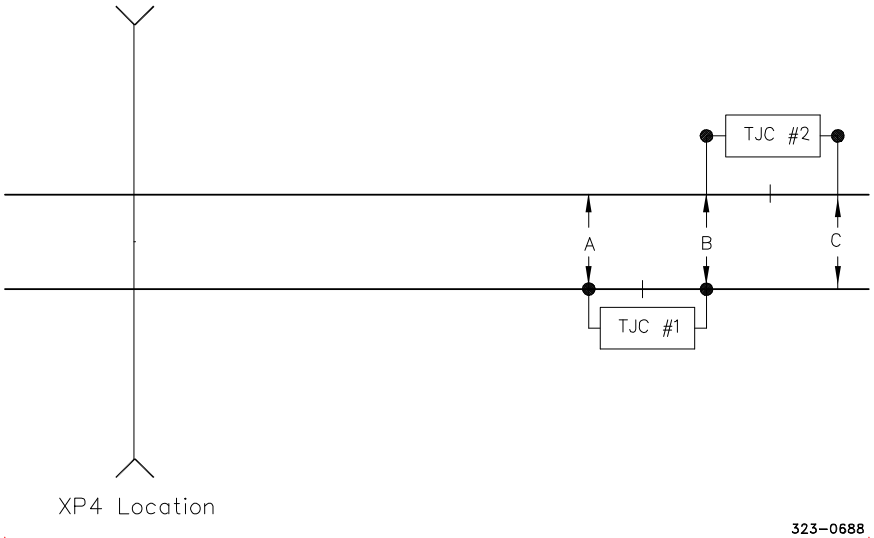

Figure X-XX, TJC Tuning Staggered Joints

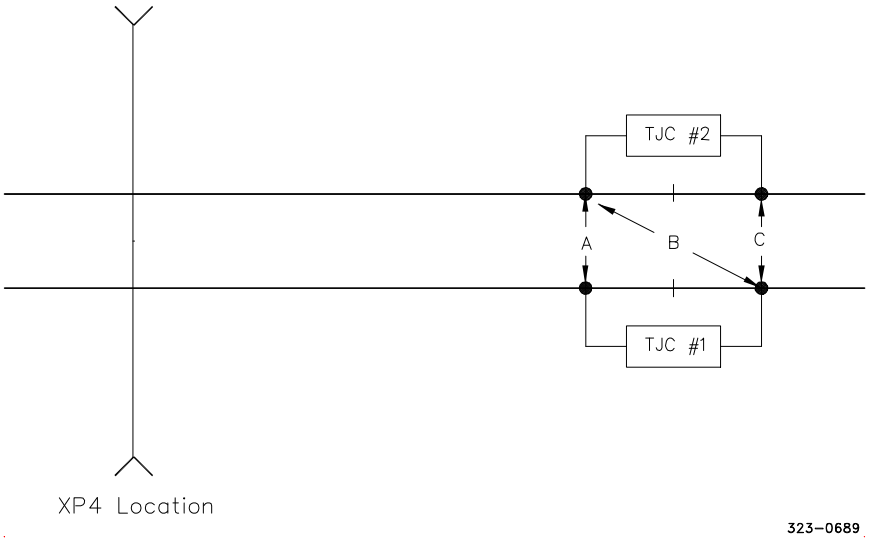

Figure X-X, TJC Tuning Non - Staggered Joints

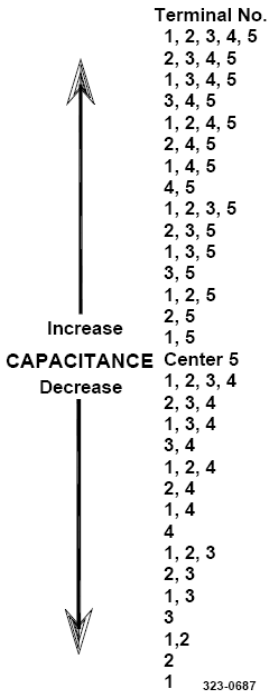

Figure X-XXX

Field Adjustment of TJCs (Tuned Joint Couplers) when designed for Motion Detect Mode

Use the following procedure to tune all TJCs in the approach. If no joints are coupled with TJCs, skip this step and continue to the next step. If TJC's are located in the outer 2/3 of the approach, use the procedure outlined above "**Field Adjustment of TJCs (Tuned Joint Couplers) when designed for Limited Predict Mode**".

- TJCs are tuned by tightening and loosening combinations of numbered AAR gold-plated nuts located inside the housing.

- The tuning arrangement is designed so each successive terminal (1 through 5) provides twice the amount of change as the previous terminal(s).

- Terminal 2 provides twice as much change as terminal No. 1 and so on.

- TJCs are shipped from the factory with No. 5 terminal nut tightened down and the remaining terminal nuts backed off. Before tuning the TJCs make sure the RX is adjusted to 100 and only nut #5 is tightened down on both couplers.

TJCs on Inner 1/3 of the Approach

Use the following procedure to tune both TJCs when they are located within the inner 1/3 of the approach.

1. Place a hardwire test shunt at location A in Figure X-XX.

2. Note the RX and Phase Angle displayed on the TRM display. If the RX value is less than 10 with the phase latched at 90, follow the procedure for tuning TJCs on the inner 10 percent of the approach.

3. Move the test shunt to location B.

4. Tune TJC #1 so the Phase Angle remains above 56 degrees. The RX value may increase in value by as much as 7 with this adjustment.

5. Move the test shunt to location C.

6. Tune TJC #2 so the Phase Angle remains above 56 degrees. The RX value may increase in value by as much as 7 with this adjustment. (The total increase in RX may be up to 14 across both TJCs.)

7. Remove the test shunt.

8. Observe the RX value and readjust if the RX is not 100".

Note: When a terminal is not used for tuning, back off the locking nut and gold-plated nut until they are both beyond the nylon friction thread insert. The nylon insert prevents the nut from loosening and possibly de-tuning the TJC.

9. The MDR drive should be energized after a minimum of two minutes. If it is not, recheck Island setups and wiring to the AUX input terminals.

TJCs on Inner 10 % of the Approach

Use the following procedure to tune both TJCs when they are located within the inner 10 % of the approach.

1. Place a hardware test shunt at location A in Figure X-XX.

2. Note the RX on the TRM display. The RX value should be less than 10 with the phase latched at 90.

3. Move the test shunt to location B.

4. Tune TJC #1 by increasing the capacitance so the RX increases to 7 greater than what was noted in step 2. Refer to Figure X-XX for TJC nut combinations. Note the new RX value.

5. Move the test shunt to location C.

6. Tune TJC #2 by increasing the capacitance so the RX increases to 7 greater than what was

recorded in step 2. (The total increase in RX may be up to 14 across both TJCs.)

Note: If the phase is not above 56 degrees after TJC#2 is tuned, refer to the section on bypassing insulated joints in the installation section for TJC installation guidelines.

7. Remove the test shunt.

8. Observe the RX value and readjust if the RX is not 100".

   Note: When a terminal is not used for tuning, back off the locking nut and gold-plated nut until they are both beyond the nylon friction thread insert. The nylon insert prevents the nut from loosening and possibly de-tuning the TJC.

9. The MDR drive should be energized after a minimum of two minutes. If it is not, recheck Island setups and wiring to the AUX input terminals.

Setting the LOS (Loss of Shunt) Time

The LOS time is the time in seconds that will run after the PMD-4/4R quits detecting motion before the MDR will be energized. The LOS Time menu is shown in Figure X-X below.

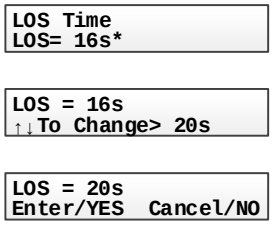

Figure X-X

Setting the False Shunt Option

False shunt detection is used to detect a sudden shunt in the approach without a train move. There are two parameters associated with the false shunt option when it is enabled. The two parameters are false shunt RX and false shunt time. The false shunt RX will set the maximum RX where a False Shunt can be detected on the approach. Programmable values are between 0 to 80 RX. False shunt time is the amount of time required before the PMD will sense a false shunt on the approach and ring the crossing. Programmable values are from 0 to 60 minutes. When set to 0 the PMD will run LOS time before ringing the crossing. The False Shunt menu is shown in Figure X-X below.

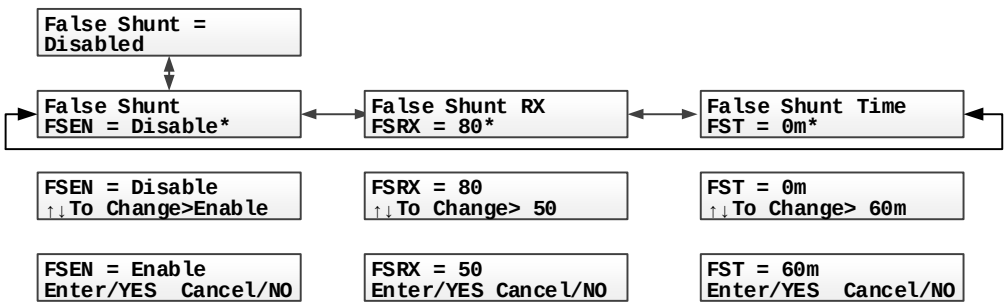

Figure X-X

Setting the Approach Release Option

Approach Release is used to detect a false shunt caused by train passage. There are two parameters associated with the approach release option when it is enabled. The two parameters are approach release RX (ARRX) and approach release time (ART). Following a train move, if the RX does not recover to an RX value above the approach release RX setting, the PMD-4/4R will wait the approach release time before dropping the MDR and ringing the crossing. Programmable values for the approach release RX are from 0 to 80. Programmable values for the approach release time are from 0 to 60 minutes. When set to 0 the PMD will run LOS time before ringing the crossing. The Approach Release menu is shown in Figure X-X below.

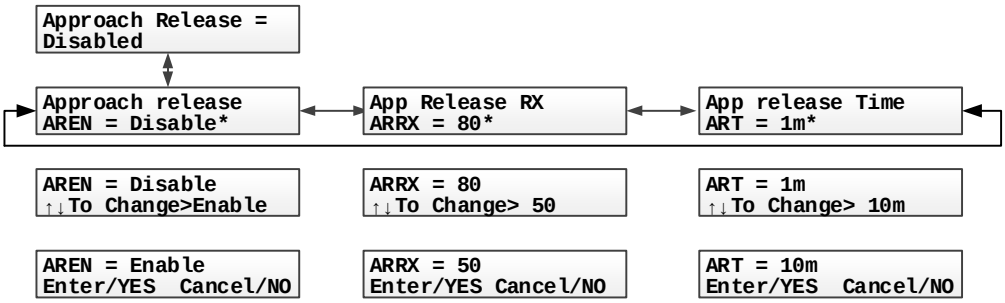

Figure X-X

Setting the Auto RX Enable/Disable Parameter

To compensate for minor changes in track conditions, the PMD-4/4R System supports an automatic RX adjustment feature. The Auto RX feature allows the RX to remain at 100 with varying ballast conditions. The RX self-adjustment range is ±10 RX. If track conditions remain within 10% of the original setting, the RX will remain at 100. When track conditions exceed an RX of 10, The RX will drift proportionally to the actual conditions. The Auto RX option lets you enable or disable the Auto-RX Adjustment. The Auto RX menu is shown in Figure X-X below.

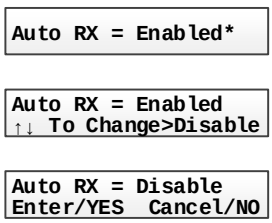

Figure X-X

Island Setup

The PMD-4/4R has the option to use the internal island circuit when the unit encompasses the island, or the island input (External Island) in applications where the PMD does not encompass the island but uses the input supplied by the island output from an adjacent PMD-4/4R.

Setting the Island Type to Internal

When the Island Type is set to Internal, the island frequency, island LOS and Fault Delay sub menus will be available on the display or Web GUI. Calibrate the Island with a .06 Ohm shunt placed on the track 7 feet outside the transmitter or receiver wires. The Select Island Type menu when set to Internal Island is shown in Figure X-X below.

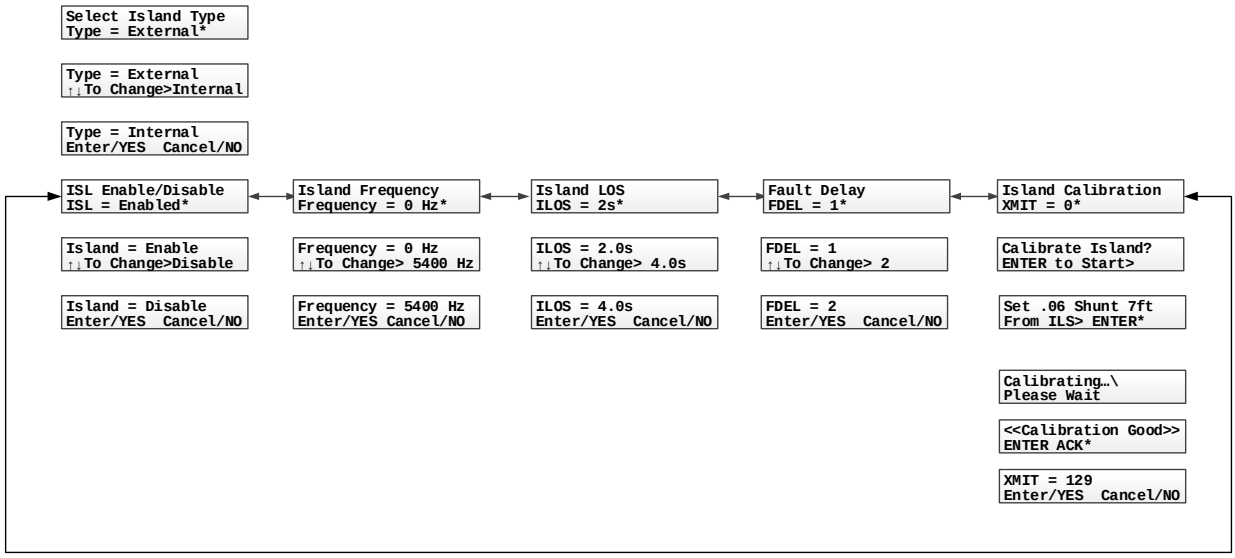

Figure X-X

Setting the Island Frequency

The PMD-4/4R System allows the island track transmitter/receiver frequency to be set in the field to any one of a predefined list of frequencies. If the Island Track Circuit is set to a frequency other than zero, the associated Island Track Circuit transmitter and receiver operates using the selected frequency as its base frequency. If the Island Track Circuit Frequency is zero, the associated Island Track Circuit transmitter and receiver will be "disabled" and the associated "Island Cleared" statuses will be set "False" (as if a train is fouling the island).

The PMD-4/4R System allows the "Island Track Circuit Frequency Selection" parameters to be set to one of the following frequencies:

4000 Hz, 4400 Hz, 4900 Hz, 5400 Hz, 5900 Hz, 6400 Hz, 7100 Hz, 7700 Hz, 8000 Hz

Setting the Island LOS Count

A user-defined parameter called Island Loss of Shunt (LOS) Count defines the number of good island signatures (in terms of time) that must be received before the crossing is declared "clear" once it has been considered "fouled." The PMD-4/4R System allows the "Island Track Circuit LOS Count" parameter to be set to one of the following times: 0.5 seconds, 2 seconds, 4 seconds.

Setting the Island Fault Delay

The Island Track Circuit Fault Delay parameter controls the length of a fixed delay that is added directly after an Island signature burst transmission. The selectable fault delay settings of 1 or 2 correspond to time delay values of 48 or 80 milliseconds, respectively. The fault setting should be staggered for same island frequencies that are located within 1000 ft.

Island Calibration

WARNING *Incorrect placement of shunts during Island calibration could result in no warning while a train is occupying the island. Failing to detect trains in the island could result in death or serious injury. Reference SRAC2.*

The island calibration menu is provided for automatic calibration of Island Transmitter gain. Once the user selects island calibration, the user is prompted to place a 0.06 Ω shunt 7 feet outside the island. Preferably, the shunt should be placed on the transmitter lead side. Once the shunt is in place, the user presses the ENTER key and PMD-4/4R adjusts the Island transmitter gain to obtain the proper level. Once island calibration is successful, the user must acknowledge the successful calibration, confirm the new island transmitter gain value and remove the 0.06 Ω shunt. As a test, place the 0.06 Ω shunt inside the Island and confirm that the Island does not recover. Following this test, remove the shunt.

If the user cancels the calibration process prior to user confirmation of the new transmitter gain value, the PMD-4/4R will retain the previous island transmitter gain value. If due to existing conditions, the PMD-4/4R is not able to successfully calibrate the island, the transmitter gain will be set to last known valid value.

Note: *If the shunt used in Island calibration is greater than 0.06 Ω or has a poor connection to the rail, a Resistive Shunt Fault may occur. Ensure the shunt is 0.06 Ω and is properly connected to the rail.*

To Test Island Calibration

Place the 0.06 Ω shunt inside the island circuit. Verify that the Island LED is OFF. Pick up the shunt and verify the Island LED is ON.

Setting the Island Type to External

When the Island Type is set to External, the Internal island setup will not be available. The island input will control all the island functions in the PMD-4/4R. The Select Island Type to External menu is shown in Figure X-X below.

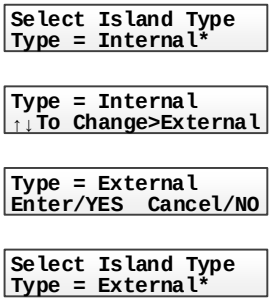

Figure X-X

Enabling/Disabling Islands

WARNING *Failure to provide protection at a crossing while an Island Track Circuit Enable parameter is set to disabled could result in no warning while a train is in the island. Failing to provide protection could result in death or serious injury. Reference SRAC2.*

Similar to the approach track, during the course of track maintenance, it may be necessary to disable the Island. When the internal island is selected the PMD-4/4R allows the internal island to be enabled or disabled in the field via the keypad. Enabling/disabling the island is independent of the enable/disable of the approach track. While an island is disabled, the state of all associated MDR statuses are not influenced by whether the island is cleared or fouled.

The island can be disabled through the keypad by using the following Island Disable menu located in the crossing maintenance menu. Once the island is disabled the user will be prompted to enter a disable timeout. The disable timeout will enable the island after the timer expires. The disable timeout can be programmed from 1 to 23 hours in one hour increments or permanently if "perm" is selected. The Island Disable menu is shown in Figure X-X below.

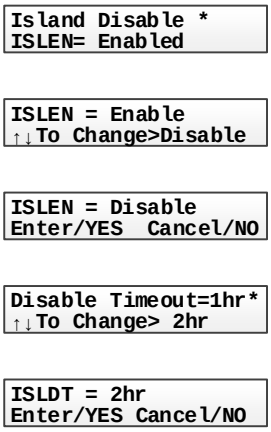

Figure X-X

Limited Prediction

The PMD-4/4R can be setup as a predictor with limited prediction capabilities. Limited predict mode can be enabled only if the limited predict selective function is enabled.

Note: The selective function menu is only available on the Web GUI. Refer to chapter XX for enabling limited prediction through the selective function menu using the Web GUI.

When the Limited predict mode is enabled the requested warning time can be selected and the LIA (Lumped Impedance Adjustment) menu will be available to linearize the approach for accurate prediction. Refer to the following chart for limited predict option available with the different applications.

PMD-4/4R Applications			
Cabinet Type	Application Name	Chassis ID	Limited Predict Option
PMD-4	pmd-4_md	1	MDR1 (MD Output) Warning Time programmable for crossing start
	pmd-4_cw	2	MDR1 (MD output) Warning Time programmable for crossing start MDR2 (AXO1 output) Warning time programmable for advanced traffic preemption
PMD-4R	pmd-4r_md	3	MDR1 (MD Output) Warning Time programmable for crossing start
	pmd-4r_cw	4	MDR1 (MD output) Warning Time programmable for crossing start MDR2 (AXO1 output) Warning time programmable for advanced traffic preemption.

The Limited Predict menu is shown in Figure X-X below.

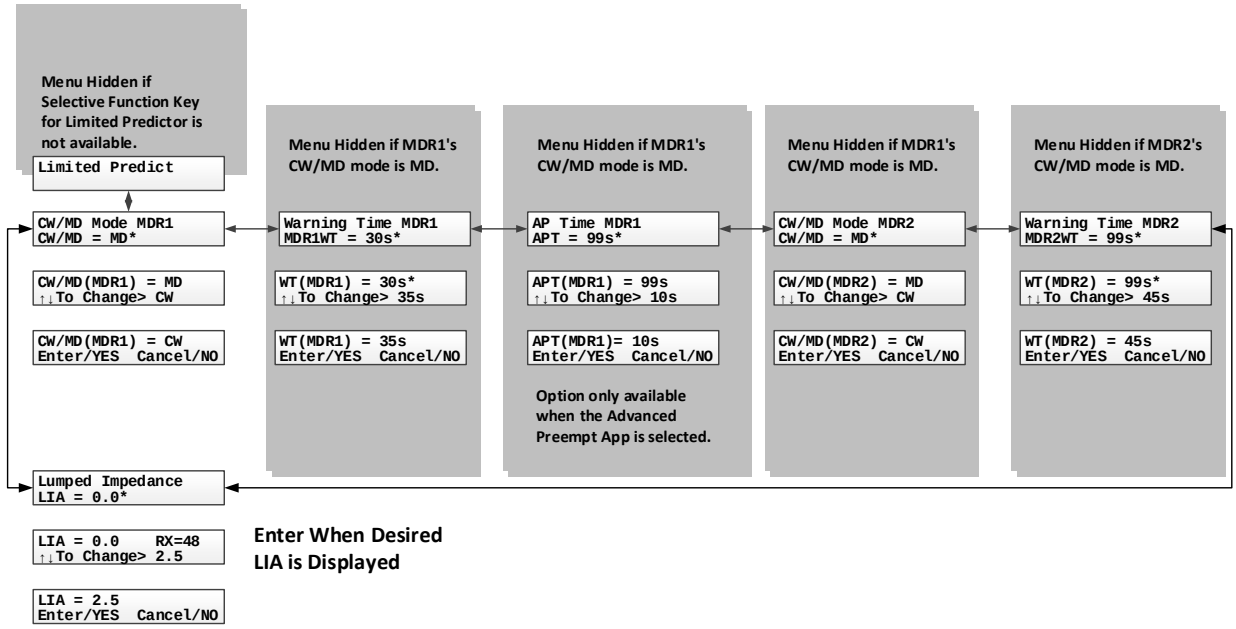

Figure X-X

Limited Predict LIA (Lumped Impedance Adjustment)

WARNING *Incorrect adjustment of an LIA parameter could result in long or short warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Procedures involving shunting of the rails may interfere with operation of coexisting signaling systems. Before performing procedures that may interfere with the signal system, obtain permission from the dispatcher or other authority per the operating rules of your railroad. Reference SRAC2.*

WARNING *Properly set the UNI/BI parameter for a crossing approach track circuit before adjusting the associated LIA parameter. Adjusting the LIA while the UNI/BI parameter is incorrectly set could result in a short or long warning time. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *For a bidirectional approach, only adjust the LIA parameter with the shunt placed on the side with the highest measured RX at 50 percent of the approach length when compared to its calculated RX at the 50 percent point. Adjusting the LIA parameter according to RX on the other side of the approach could result in short warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

To accurately predict a trains arrival time at the crossing in limited predict mode, the PMD-4/4R requires a linear change in the RX. The LIA (Lumped Impedance Adjustment) is the method used to linearize the RX.

The LIA should always be made:

- During initial installation.
- Anytime a change is made in an approach.
- Anytime equipment is added or removed within an approach.

Note: *When connecting the hardwire shunt on an approach terminated with a NBS (Narrow Band Shunt) the RX will normally decrease to a value between "85" and "100", depending on the frequency and length of the approach. When connecting the hardwire shunt on an approach terminated with a Wideband or Hardwire shunt, the RX should not change. If a change is noted, check all connections and if the connections are good, replace the shunt.*

When shunting, use the "Grade Crossing Location Record", located in the front of this manual to record the information.

1. Ensure RX is 100. Then connect a hardwire test shunt at the approach termination.
2. Note the RX value with the hardwire test shunt at the termination.
3. To verify the approach if the type of shunt used at the termination is a hardwire or wideband shunt, place another hardwire shunt 10% in from the termination shunt. A signal change of approximately 10% should be seen. If not, check all couplers and track connections.
4. Place the hardwire test shunt in the approach at the measured 50 percent point (measured from the nearest track wire connections).
5. Calculate what the expected RX should be at the 50 percent point using the RX value from step 2.

   For example:

   The RX value from step 2 is 90. The expected value for the RX at the 50 percent point would be calculated as follows: $90 \div 2 = 45$
6. Place the hardwire test shunt at the 50 percent point, advance to the LIA section of the Limited Predict menu (reference Figure X-X).
7. While viewing the RX on the display, press the **up arrow key** to count up or the **down arrow key** to count down until the RX reads the value derived from the calculation in step 5.
8. Press the **ENTER** key to accept the value or **CANCEL** to reject the value.
9. Remove the test shunt at the 50 percent point.
10. For a bi-directional PMD-4/4R, repeat the LIA adjustment and operational checkout procedure for the opposite approach. When step 7 is reached, make an adjustment only when the RX, at the 50 percent point, is above the calculated value from step 5. Do not raise the RX if the value is lower than calculated for the second approach.

MDR1 Warning Time Setting

WARNING *Incorrectly setting the Requested Warning Time for an MDR could result in short or longer than desired warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

The Requested Warning Time is the amount of time the user is requesting that the MD output will drop (crossing ringing) prior to a train arriving at the island.

MDR1 AP Time (Only available with the pmd-4_cw and pmd-4r_cw applications)

The AP Time (Advanced Preempt times) is the amount of time in seconds from when MDR2 drops the advanced preempt output (AXO1) andMDR1 drops the crossing start output (MD). When the AP Timer is used with the advanced preempt applications, the MDR1 requested warning time is the minimum warning time for accelerating trains.

MDR2 Warning Time Setting (Only available with the pmd-4_cw and pmd-4r_cw applications)

The Requested Warning Time is the amount of time the user is requesting that the AXO1 output will drop (Advanced Traffic Preemption) prior to a train arriving at the island. MDR2 also starts the MDR1 AP Timer.

Note: *If both a Vital Input and the CDU are used to disable an Island, the Island will be re-enabled upon a system reset. To disable the Island again, you must disable it through the CDU.*

WARNING *After initial setup of PMD-4/4R Field Related Configuration Settings, adequate testing must be performed to detect any errors related to these configuration settings. The tests should be performed before the unit is placed into service and in accordance with standard railroad, FRA, and/or other regulatory agency rules. The tests should be performed by qualified personnel that have the knowledge to correctly and safely discharge the tests. Failure to adequately test the PMD-4/4R unit after the initial setup could result in death or serious injury. Reference SRAC2.*

Final Checkout (Initial Installation)

Before placing the unit is service, complete the following:

Enable the Shunt Test Mode located in the Crossing Maintenance Menu. Place a hardwire test shunt at the termination. Verify that the RX decreases and the MD output drops starting the crossing. Repeat this step for the other approach in a bi directional application. In some instances such as when a hardwire or wideband termination shunt is used, the RX may not change. If that is the case move the test shunt in 10% and re-shunt.

Note: This step can be done when the LIA is setup in limited predict mode setup.

When the shunt tests are completed, disable the shunt test mode.

Observe a train movement, one inbound on each approach. As the train travels inbound, the RX should decrease in a linear manner.

- Configure as appropriate the Site ID, Time, Date and Ethernet settings.

- On remote unidirectional units, observe an inbound or outbound move for the proper increase or decrease in RX.
- Verify the correct warning time is achieved.
- As the train travels outbound from the crossing, the RX should increase in a linear manner.
- If the RX does not appear linear recheck all couplers and LIA adjustments.

Checkout (Existing Installations)

Introduction

This section provides the maintainer with procedures for checking the operation of the PMD-4/4R after the unit:

- Has been changed out
- Software upgraded
- Been reprogrammed after a “set to default values “
- Maintenance has occurred to the track (ballast, ties, or new track circuitry introduced to the PMD-4/4R approach).

For constant speed trains PMD-4/4R control systems furnish, as a minimum, the selected warning time provided all application guidelines are met and adjustments are in accordance with PMD-4/4R manual requirements.

Follow the four steps below to determine how to checkout a PMD-4/4R system after a chassis change out or a software upgrade.

1. Verify adequate warning time was achieved with the last ten train moves through the crossing on each PMD-4/4R approach affected (normal direction running).
2. Verify all options and adjustments remain at their previous settings.
3. Verify the RX value is between 105 and 95 (109 and 91 if Auto RX is disabled), also ensure that the RX value is stable (+ or - one digit).
4. If a rail is replaced or the crossing is out of service for greater than 24 hours prior to LRU change or software upgrade, verify that no visible changes have occurred causing shunt conditions (rust, film on the rail, etc.) to deteriorate to greater than .06 ohms within all PMD-4/4R approaches.

Chapter 4 – Maintenance

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Chapter 4 – Maintenance

Introduction

This chapter contains maintenance procedures for performing maintenance activities for the PMD-4/4R system.

WARNING *During each 90-day inspection, operations should be switched over to inactive Normal/Standby modules and proper operation verified. Error logs should be examined for intermittent failures during the 90-day period. Failure to verify operation and examine the error log could allow multiple failures over time to combine, resulting in an unsafe condition that could result in death or serious injury. Reference SRAC2.*

WARNING *Railroad Configuration Management Procedures must ensure that all PMD-4/4R units are configured with the proper revisions of modules and firmware (both application and executive) and that updates are completed in a timely manner when made available by GE Transportation Global Signaling. Operating with incorrect firmware may result in death or serious injury. Timely is defined as without undue delay per 49 CFR 236.1023(j). Reference SRAC2.*

WARNING *Railroad Configuration Management Procedures must ensure that the proper values are set for each crossing parameter, vital timer, vital configuration setting (vital soft switches), PTC Wireless Crossings vital parameters, and vital remote parameter in their PMD-4/4R units. Incorrect settings may result in death or serious injury. Reference SRAC2.*

WARNING *After performing any maintenance or system enhancements on the PMD-4/4R unit, adequate testing must be performed to detect any errors related to any adjustments made to the system. The tests should be performed before the unit is returned to service and in accordance with standard railroad, FRA, and/or other regulatory agency rules. Failure to adequately test the PMD-4/4R unit after routine or preventive maintenance could result in death or serious injury. Reference SRAC2.*

WARNING *Equipment or track changes within the crossing approach track circuits can affect warning times. Failure to verify and properly adjust PMD-4/4R crossing adjustments could result in long or short warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *The PMD-4/4R system relies on rail-to-rail shunting by on- track equipment to provide adequate warnings times and train detection at Highway-rail grade crossings. Rails and on-track equipment must be periodically inspected and maintained to ensure proper shunt detection. Failure to adequately inspect and maintain the rails and on-track equipment could result in death or serious injury. Reference SRAC2.*

WARNING *The PMD-4/4R system relies on rail-to-rail shunting by on- track equipment to provide adequate warnings times and traindetection at Highway-rail grade crossings. Ballast, rails, and other rail-attached equipment must be periodically inspected and maintained to ensure they don't interfere with proper shunt detection. Failure to adequately inspect and maintain the track and related equipment could result in death or serious injury. Reference SRAC2.*

WARNING *LIA must be checked and adjusted if any changes are made within the associated crossing approach track circuit or equipment is added or deleted. Failure to check and properly adjust the LIA parameter could result in long or short warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Moving an PMD-4/4R Unit from one location to another without properly setting the PMD-4/4R crossing parameters,Vital Timers and Vital Configuration Settings (vital soft switches) for the new location, could result in long or short warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *After proper adjustment of the PMD-4/4R crossing parameters, vital timers, vital configuration settings and vital remote settings, adequate testing must be performed to detect any errors/failures related to the new equipment and /or the parameter settings. The tests should be performed before the unit is returned to service and in accordance with standard railroad, FRA, and/or other regulatory agency rules. The tests should be performed by qualified personnel that have the knowledge to correctly and safely discharge the tests. Failure to adequately test the PMD-4/4R unit after performing corrective maintenance could result in death or serious injury. Reference SRAC2.*

WARNING *After the PMD-4/4R has been initially installed and adjusted, the Transmitter Check parameters should never be readjusted without first verifying there has not been a degradation of any portion of the Island (track, track wires, and rail connections). Failure to do so may result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Properly set the UNI/BI parameter for a crossing approach track circuit before adjusting the associated LIA parameter. Adjusting the LIA while the UNI/BI parameter is incorrectly set could result in a short or long warning time. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *RX and Phase levels should be logged and periodically reviewed for each approach track. If significant changes occur, the cause must be verified with checkout shunting procedures. Failure to do so may result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Before making any Transmitter Check parameter adjustments, verify that all rail connections provide a good low impedance contact.Inspect the Island and track wire connections. Any high impedance connections detected must be corrected before proceeding to prevent short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Procedures involving shunting of the rails may interfere with operation of coexisting signaling systems. Before performing procedures that may interfere with the signal system, obtain permission from the dispatcher or other authority per the operating rules of your railroad. Reference SRAC2.*

WARNING *Failure to provide protection at a crossing while an Approach Track Circuit Enable parameter is set to disabled could result in no warning time. Failing to provide protection could result in death or serious injury. Reference SRAC2.*

WARNING *Wireless Crossings should be Disabled before performing any maintenance or troubleshooting on the PMD-4/4R unit by setting the {protocol} Comm vital parameter to Disabled. Verify the {protocol} Wireless Crossings Enabled parameter is 'Disabled' before performing any maintenance or troubleshooting. Failure to comply could result in death or serious injury. Reference SRAC2.*

Visual Inspection

Inspect PMD-4/4R wiring for cut, nicked, or bare wires. Repair as necessary.

Maintenance Procedures Using the Display and Keypad

The PMD-4/4R will prompt the user for "Local User Confirmation" prior to allowing parameter modification. See *Chapter 3 – Setup, Calibration, and Checkout using the Display and Keypad - Local User Confirmation* for information on obtaining and canceling Local User Confirmation.

WARNING *When entering information on the key pad that requires confirmation, verify that the new value re-displayed by the system matches the intended value. Confirmation of an incorrect value could result in a less restrictive condition which could cause death or serious injury. Reference SRAC2.*

Crossing Maintenance Menu

The following figure shows the menu structure for the crossing maintenance Menu. The Crossing Maintenance Menu is where most of the maintenance activities can be performed. The Crossing Maintenance menu is shown in Figure X-X below.

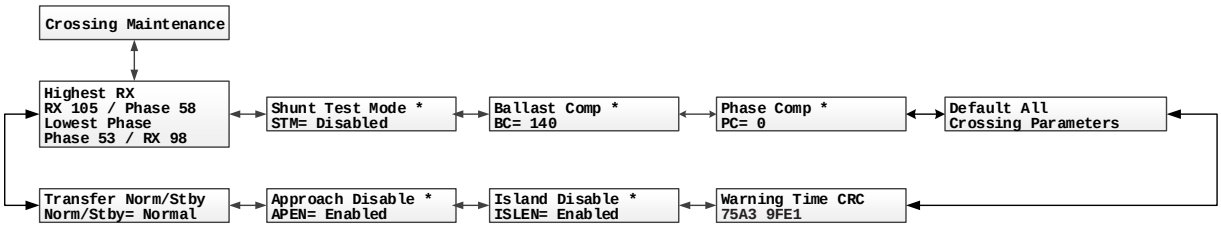


Figure X-X

Highest RX / Lowest Phase Menu

To evaluate changing track/ballast conditions for a crossing approach track, it is useful to keep track of the highest stable RX and lowest stable Phase values seen over an extended period of time. The PMD-4/4R maintains the highest stable RX value and the corresponding phase value for each approach. It also tracks the lowest stable phase value and its corresponding RX value. These four values are stored in non-volatile memory so the information can persist even through a PMD-4/4R Power down. The four values can be monitored using the display and keypad or Web GUI.

The Highest Stable RX and corresponding Phase values and Lowest Stable Phase and corresponding RX are reset to current values when any one of the following occurs:

- A "High Signal / Low Phase Reset" operation is performed.
- The ATC frequency selection parameter is changed from zero to any valid frequency setting,
- The approach transmitter gain value is changed from zero to a non-zero value.

High Signal Fault Condition

The PMD-4/4R maintains a separate High Signal Fault Condition for the approach track. A High Signal Fault Condition is set for the approach track if the RX level is 110 or higher for 5 seconds. A display Alarm is generated and the High Signal LED is lit when the fault condition is detected. The PMD-4/4R will automatically clear the High Signal Fault Condition and remove the display Alarm if the RX level drops below 110 for two minutes. The High Signal LED is not cleared automatically and remains lit until manually cleared. The PMD-4/4R continues to light the LED to provide an indication that a fault has been detected.

The user can manually clear the High Signal Fault Condition, the associated display Alarm and LED immediately by performing a High Signal / Low Phase Reset operation on the approach while the RX level is below 110 or the approach transmitter is "disabled".

The PMD-4/4R stores the state of the High Signal Fault Condition and the High Signal LED in non-volatile memory so that the information persists through an PMD-4/4R power down condition. The Highest RX and Lowest Phase menu is shown in Figure X-X below.

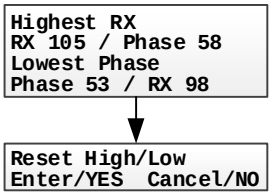


Figure X-X

Shunt Test Mode Menu

During standard maintenance and testing procedures, it may be necessary to perform what is called a "Shunt test" to ensure that crossing gates and lights are operating correctly. Shunt Test Mode enables these procedures by allowing the field maintainer to place a shunt on an approach track and immediately test the approach circuit connected to the PMD-4/4R without any sudden shunt override or delay in response.

The user must first enable the Shunt Test Mode setting via the keypad and display or Web GUI. Note that Local User Confirmation is required for this parameter to be enabled. Also note that changes in the state of Shunt Test Mode result in entries into the configuration Change Log and the Crossing Setup Log. While Shunt Test Mode is enabled, the Motion LED on the front panel will flash. When a test shunt is placed on the approach the MDR output will drop and activate the crossing.

Note: *Once Shunt Test Mode is enabled, it will only be disabled if:*

1. *The user manually disables Shunt Test Mode via the keypad or Web GUI.*
2. *Approach Gain Calibration is performed, or*
3. *Local User Confirmation expires (30 minutes from last key press).*

Otherwise, Shunt Test Mode will remain enabled, which could result in Long warning times.

The Shunt Test Mode menu is shown in Figure X-X below.

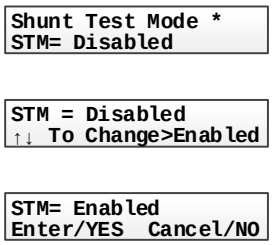


Figure X-X

Ballast Compensation Menu

Ballast Compensation is a maintenance adjustment tool used to compensate for changing RX levels due to varying ballast conditions over time. The default ballast compensation value is frequency dependent. Following is the chart of default values for each frequency

FREQ	BC
86 Hz	122
114 Hz	125
135 Hz	127
151 Hz	129
156 Hz	129
172 Hz	130
210 Hz	133

FREQ	BC
211 Hz	133
230 Hz	135
267 Hz	137
285 Hz	138
326 Hz	141
348 Hz	142
392 Hz	143

FREQ	BC
430 Hz	145
452 Hz	145
522 Hz	147
525 Hz	147
560 Hz	148
630 Hz	148
645 Hz	149

FREQ	BC
686 Hz	149
753 Hz	149
790 Hz	149
816 Hz	149
881 Hz	149
970 Hz	150
979 Hz	150

The Ballast Compensation should be adjusted when the RX changes by a value of 5 or more in either direction, from 100, due to changes in ballast conditions. The highest stable RX and the lowest stable Phase value shown on the display can assist in determining the correct Ballast Compensation adjustment. Keeping a history log of the RX and phase values along with ballast conditions can help determine if a ballast Compensation adjustment is required.

If the RX increases when the Phase angle decreases and the RX decreases when the Phase angle increases, decrease the Ballast Comp value by a factor of 2 for every RX change of 1.

For example: If the Ballast Comp value is 140 and the RX increases to 110 when the Phase angle decreases (deteriorating ballast) and the RX decreases to 100 when the Phase angle increases (improving ballast), decrease the B value from 140 to 120.

If the RX decreases when the phase angle decreases and the RX increases when the phase angle increases, increase the BC value by a factor of 2 for every RX change of 1.

For example: If the RX decreases to 85 when the Phase angle decreases (deteriorating ballast) and the RX increases to 100 when the Phase angle increases (improving ballast), increase the B value from 140 to 160.

The Ballast Comp menu is shown in Figure X-X below.

```
Ballast Comp *
BC= 140
```

```
BC=          140
↑↓ To Change>  135
```

```
BC=          135
Enter/YES  Cancel/NO
```

Figure X-X

Phase Compensation Menu

WARNING *To determine if Phase Compensation can be safely adjusted, place a hard wire test shunt 90 percent out on the appropriate approach. The RX must drop a minimum of 5 below what the RX is with a hard wire shunt at the termination of the approach. Adjusting Phase Compensation when not appropriate, could result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

Phase Compensation is a maintenance adjustment used to compensate the phase angle in poor ballast conditions when a Low Phase condition exists (Phase angle 32° or below). Phase compensation can add up to 10° to the phase angle. Before the Phase Compensation adjustment can be made to the approach, the Phase Compensation shunting procedure must be performed. To determine if Phase Compensation can be performed, follow the Phase Compensation procedure in chapter 5 under Low Phase problems. The Phase Comp menu is shown in Figure X-X below.

```
Phase Comp *
PC= 0
```

```
PC=            0
↑↓ To Change>  5
```

```
PC=            5
Enter/YES  Cancel/NO
```

Figure X-X

Default All Parameters

During installation of a PMD-4/4R, it may be desirable to initially set all crossing parameters to a known state. The PMD-4/4R allows all crossing parameters to be defaulted via a single **Default All** operation. During the **Default All** operation, parameters are set to either a fixed **Factory Default** value or to an **Application Program Default** value. The **Application Program Default** values are established by the application engineer when programming the application.

Parameters With Factory Defaults

Parameter Name	Factory Default Value
Site ID	Blank

Approach Track Circuit Enable/Disable	Enabled
Maximum Approach Track Disable Time	2 hours
Approach Transmitter Gain	Zero (0)
Normal, Short, and Very Short Approach	Normal
Transmitter Check Adjustment	Zero (0)
Ballast Compensation	Refer to Ballast Compensation in *Section 4 - Maintenance*
Phase Compensation	Zero (0) Degrees
Auto RX	Enabled
Island Selection	Internal
Island Track Circuit Enable/Disable	Enabled
Island Frequency	0 Hz
Island Transmitter Gain	0
Island Track Circuit LOS Count	2 sec
Island Fault Setting	2

Application Program Defaults for the Standard Pre-Loaded Programs

Parameter Name	Application Default Value
Approach Length	9999 ft
Approach Track Circuit Master/Slave	Master
Unidirectional / Bi-directional	Bi
Loss Of Shunt (LOS) Time	16 sec
False Shunt Detection Enable/Disable	Disable
False Shunt Detection RX Level	80 RX
False Shunt Detection Delay Time	0 min
Approach Release Enable/Disable	Disable
Approach Release RX Level	80 RX
Approach Release Delay Time	0 min
Constant Warning / Motion Detector Mode	MD
Requested Warning Time	99 sec (Limited predict mode only)
Advance Preempt Time	30 sec (Limited predict mode only)
AUX Recovery Delay	5 sec

The Default All Crossing Parameters menu is shown in Figure X-X below.

```
Default All
Crossing Parameters
```

```
Default All Params
Enter/YES  Cancel/NO
```

Figure X-X

Normal Standby Operation (PMD-4R Only)

WARNING *During each 90-day inspection, operations should be switched over to inactive Normal/Standby modules and proper operation verified. Error logs should be examined for intermittent failures during the 90-day period. Failure to verify operation and examine the error log could allow multiple failures over time to combine, resulting in an unsafe condition that could result in death or serious injury. Reference SRAC2.*

The PMD-4R system is equipped with redundant track module and redundant VIO inputs and outputs. Periodically, it is necessary to switch operation to the inactive module to verify that the inactive module is fully functional and available when needed. The PMD-4R provides a Forced Switch Over mechanism to transfer control/monitor activities from an active module to the inactive module within a Normal/Standby pair at the request of the user. The Forced Switch over operation can be performed via the PMD-4R keypad and display or Web GUI. The Transfer Norm/Stby menu is shown in Figure X-X below.

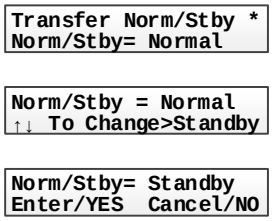


Figure X-X

Approach Disable

WARNING *Procedures involving shunting of the rails may interfere with operation of coexisting signaling systems. Before performing procedures that may interfere with the signal system, obtain permission from the dispatcher or other authority per the operating rules of your railroad. Reference SRAC2.*

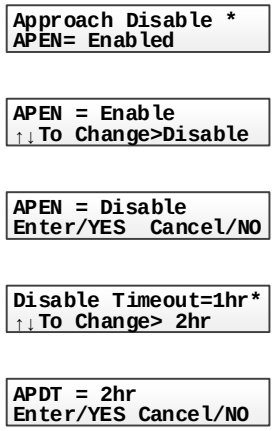
WARNING *Failure to provide protection at a crossing while an Approach Track Circuit Enable parameter is set to disabled could result in no warning time. Failing to provide protection could result in death or serious injury. Reference SRAC2.*

In addition to normal operation, sometimes it is necessary to disable an approach track due to track work or other maintenance activities. Follow all railroad operating rules before disabling an approach track. While the approach is Disabled, the crossing executive software sets all related MDR Statuses to their "True" (Energized) state for the disabled approach. A configurable timer is available to limit the amount of time the approach is disabled. This timer is configurable from 1 hour to 24 hours, in 1-hour increments. The timer may also be disabled indefinitely by setting it to "Perm". When an approach track is disabled, the MDR output will be held high unless the island circuit goes false. While the approach is disabled, the approach transmitter remains active and the RX and phase values for the approach are available through the CDU.

When the Approach Track Circuit is set to Disabled, the following LEDs will blink:

- ATC Enable
- Master
- Slave
- High Signal
- Low Phase
- Motion Detect

The Approach Enable/Disable setting may be changed in the field via keypad and display. The Approach Disable menu is shown in Figure X-X below.



Disable Timeout only shows when the approach is disabled

Figure X-X

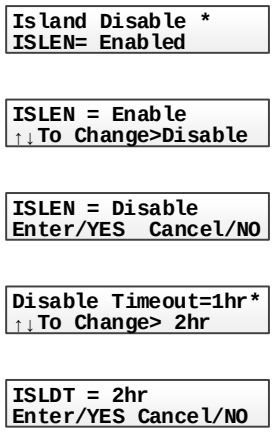
Island Disable

In addition to normal operation, sometimes it is necessary to disable an island track due to track work or other maintenance activities. Follow all railroad operating rules before disabling an island track. While the island is Disabled, the crossing executive software sets the related island Statuses to their "True" (Energized) state for the disabled island. A configurable timer is available to limit the amount of time the island is disabled. This timer is configurable from 1 hour to 24 hours, in 1-hour increments. The timer may also be disabled indefinitely by setting it to "Perm". When an island track is disabled, the island output will be held high. While the island is disabled, the approach is still active unless the approach is also disabled.

When the Island Track Circuit is set to Disabled, the following LEDs will blink:

- ITC Enable
- Master
- Slave
- High Signal
- Low Phase
- Motion Detect

Use the following menu to enable and disable the island circuit. Note: The Island Disable menu is only available when the internal island is selected. The Island Disable menu is shown in Figure X-X below.



Disable Timeout only shows when the Island is disabled

Figure X-X

Warning Time CRC

An eight digit Warning Time CRC is displayed that shows the current setup of the unit. The Warning Time CRC will not change unless a vital parameter that could affect the warning time has been changed. After the initial setup and checkout is performed, the warning time CRC should be recorded in the Grade Crossing Location Record form. The Warning Time CRC menu is shown in Figure X-X below.

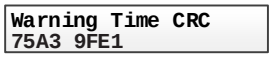


Figure X-X

Island Calibration

As conditions change or if certain island parameters are changed or defaulted, recalibration of an island may be required. The island can be calibrated via the display and keypad or Web GUI. See *Chapter 3 - PMD-4/4R Parameter Setup, Adjustment, and Calibration* of this manual for details of the Island Calibration Procedure.

Approach Calibration

Just like the island, changes in conditions or other parameters can require recalibration (RX adjustment) of the approach track circuit. The approach track can be calibrated via the display and keypad. See *Chapter 3 - PMD-4/4R Parameter Setup, Adjustment, and Calibration* of this manual for details on the approach calibration procedure.

PMD-4/4R Maintenance Procedures

WARNING *If a PMD-4/4R is replaced, verify and properly set all vital Timer values, Vital Configuration setting (vital soft switches), vital remote parameters, and all crossing parameters. Failure to verify and properly set all of these configuration items could result in falsely permissive operation and short warning times. Falsely permissive operation and short warning time could result in death or serious injury. Reference SRAC2.*

WARNING *If an PMD-4/4R Application Program Selection is changed (even if returned to the original selection) the Vital Timer values, Vital Configuration settings (vital soft switches), vital remote parameters, and all crossing parameters must be verified and properly set. Failure to verify and properly set all of these configuration items could result in falsely permissive operation and short warning times. Falsely permissive operation and short warning time could result in death or serious injury. Reference SRAC2.*

PMD-4/4R Power ON

1. Verify all connectors are securely installed on the PMD-4/4R chassis
2. Place the Power Switch to the ON position.
3. Verify system powers up and starts self-test.

Removing Power From PMD-4/4R

1. Place the Power Switch to the OFF position.
2. Disconnect the supply battery from the PMD-4/4R unit.

SSM (Site Specific Module) Installation and Removal

Component ESD Notice

To protect against ESD damage to electronic equipment containing components, follow the field procedures in AREMA C&S Manual , Part 11.4.5. Failure to use recommended protective measures could result in permanent equipment damage, either immediate or latent, when handling components.

WARNING

Before returning the PMD-4/4R to service, verify the Crossing Parameters, Vital Configuration Settings (vital soft switches), vital remote parameters, and Timer Values against the Application Circuit Plan. Failure to verify these vital parameters could result in a falsely permissive condition and short warning times that could result in short or long warning times Reference SRAC2.

WARNING

Verify power is removed from the PMD-4/4R when installing or removing the SSM (Chassis Information/Applications Module). Failure to remove power from the PMD-4/4R may damage the SSM Module. Reference SRAC2.

SSM Module.

The Site Specific Module (SSM) contains the Crossing chassis configuration and Application information used by the PMD4/4R. The SSM is shown in Figure X-X below.

Figure X-X

Installation

1. Verify the Power Switch is in the OFF position.
2. Install the SSM Module by matching the module guides with the slots in the backplane assembly.
3. When the connector on the backplane assembly is seated against the connector on the SSM, the SSM is correctly installed.
4. Verify proper operation of the PMD-4/4R system as detailed in *Chapter 9 - PMD-4/4R Retest Guide*

Removal

1. Place Power Switch to the OFF position.
2. Locate the SSM Module.
3. Gently squeeze the side tabs on the SSM Module.
4. Carefully remove the SSM Module by pulling it away from the PMD-4/4R Chassis.

Note: *Misalignment may cause one or more of the pins to bend and prevent correct operation of the PMD-4/4R.*

Note: *When the system is powered-up, the Data Logs will be erased by the VPM software as the information stored in the new EPROM will not be compatible with the information contained in the Data Logs.*

Note: *The PMD-4/4R will be installed with GE part number* 227779-002(PMD-4) and part number 227779-003(PMD-4R) *which can be interchangeable.*

1. Verify proper operation of the PMD-4/4R system as detailed in *Chapter 9 - PMD-4/4R Retest Guide.*

Backplane Fuse Replacement

The backplane fuses are standard automotive style fuses that can be purchased at any automotive supply store. Refer to Table X-X Backplane Fuse Chart below for fuse value and GETSGS part number.

Table X-X. Backplane Fuse Chart

Fuse	Circuit Protected	GETSGS Part Number	Value	PMD-4 or PMD-4R
F7	Battery B12 Fuse	010179-010	10 Amp	4/4R
F1	+5 V Fuse	010179-008	7.5 Amp	4/4R
F3	I/O Fuse	010179-007	3 Amp	4/4R
F4	XTI-1S	010179-004	4 Amp	4
F6	Normal XTI-1S	010179-004	4 Amp	4R
F5	Stand-by XTI-1S	010179-004	4 Amp	4R
F2	NSM	010179-007	3 Amp	4R

1. Place Power Switch to the OFF position.
2. Remove blown fuse.
3. Replace fuse with suitable replacement.
4. Place Power Switch to the ON position.
5. Verify proper operation of PMD-4/4R system based on the current application.

Unit Replacement Procedure

Add procedure for replacing unit

1. **Disconnect connectors and SSM**
2. **Replace unit**
3. **Reconnect connectors and SSM**
4. **Power unit up**
5. **Select correct chassis ID and application**
6. **Verify all settings and warning time CRC**
7. **Shunt approach and island**

Annual Warning Time Retest Procedures

The purpose of this procedure is to provide a method for reducing the time and effort needed to perform the required FRA annual warning time tests. This is accomplished by mapping all critical site specific switch and adjustment settings, including gain settings, which can affect warning time, and assigning a single comprehensive CRC value called the Warning Time CRC (WT CRC). The process of accomplishing this is to initially setup, test and document the operation of the warning system. When testing has been satisfactorily completed, a WT CRC value is generated from the combined internal settings of the PMD-4/4R for the specific site. The resulting unique WT CRC number simplifies the verification of all of these settings. This WT CRC can be compared to later inspections to determine, conclusively, if any site specific setting has been changed since the unit was last operationally verified and documented. If the two numbers agree, it is certain that no critical PMD-4/4R parameters have been changed that would affect warning time. Provided that the

WT CRC and additional display values, such as RX and Phase remain within normal parameters, the PMD-4/4R can be safely recertified. The WT CRC value can be viewed in the Crossing Maintenance Menu. The following verification form specifies the items that should be checked to verify that no parameters have changed that would affect the warning time.

- Base testing values should be captured upon initial installation or upon recertification of warning time operation.
- Mark any not applicable items as NA.
- If the values differ from the specified limits, then the original process of initial setup, test and documentation should be performed.

Periodic Warning Time Test Form For PMD-4/4R					
Location:					
Date:					
Parameter	**Parameters to Verify**	**Type of Setting**	**Base testing values**	**Current test - Normal Units**	**Current test - Standby units**
RX	**RX is within 95 to 105 (91 to 109 if Auto RX is disabled) and is stable +/- one digit.**	**Display Value**			
Site Specific Parameter	**Verify the Warning Time Parameter CRC value matches the base testing value. Also recorded on the Grade Crossing Location Record form.**	**Setup Log**			
External Wiring	**Activate the crossing and verify the crossing warning devices all operate as intended.**	**NA**			**NA**
Remote Starts	**Verify that all remote start controls activates all crossing warning devices as intended.**	**NA**			**NA**

Chapter 5 – Troubleshooting

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Chapter 5 – Troubleshooting

WARNING *Procedures involving shunting of the rails may interfere with the operation of coexisting signaling systems. Before performing procedures that may interfere with the signal system, obtain permission from the dispatcher or other authority per the operating rules of your railroad. Reference SRAC2.*

WARNING *PMD-4/4R troubleshooting and repair must be accomplished in a timely manner. Proper and timely maintenance is required for the equipment to provide failsafe operation. Failure to report failures and repair the PMD-4/4R in a timely manner could allow multiple failures over time to combine, resulting in an unsafe condition that could result in death or serious injury. Timely is defined as without undue delay per 49 CFR 236.1023(j). Reference SRAC2.*

WARNING *After performing corrective maintenance on the PMD-4/4R unit, adequate testing must be performed to detect any errors/failures related to the new equipment and /or maintenance. The tests should be performed before the unit is returned to service and in accordance with standard railroad, FRA, and/or other regulatory agency rules. The tests should be performed by qualified personnel that have the knowledge to correctly and safely discharge the tests. Failure to adequately test the PMD-4/4R unit after performing corrective maintenance could result in death or serious injury. Reference SRAC2.*

WARNING *Moving an PMD-4/4R Unit from one location to another without properly setting the PMD-4/4R crossing parameters,Vital Timers and Vital Configuration Settings (vital soft switches), and vital remote parameters for the new location, could result in long or short warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *After proper adjustment of the PMD-4/4R crossing parameters, vital timers, vital remote parameters, and vital configuration settings, adequate testing must be performed to detect any errors/failures related to the new equipment and /or the parameter settings. The tests should be performed before the unit is returned to service and in accordance with standard railroad, FRA, and/or other regulatory agency rules. The tests should be performed by qualified personnel that have the knowledge to correctly and safely discharge the tests. Failure to adequately test the PMD-4/4R unit after performing corrective maintenance could result in death or serious injury. Reference SRAC2.*

WARNING *After the PMD-4/4R has been initially installed and adjusted, the Transmitter Check parameters should never be readjusted without first verifying there has not been a degradation of any portion of the Island (track, track wires, and rail connections). Failure to do so may result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Before making any Transmitter Check parameter adjustments, verify that all rail connections provide a good low impedance contact.Inspect the island and track wire connections. Any high impedance connections detected must be corrected before proceeding to prevent short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

WARNING *Wireless Crossings should be Disabled before performing any maintenance or troubleshooting on the PMD-4/4R unit by setting the {protocol} Comm vital parameter to Disabled. Verify the {protocol} Wireless Crossings Enabled parameter is 'Disabled' before performing any maintenance or troubleshooting. Failure to comply could result in death or serious injury. Reference SRAC2.*

Introduction

This section will provide the maintainer with a guide for troubleshooting grade crossings controlled by PMD-4/4R units. Step by step procedures are used to eliminate possible problem areas and a list of diagnostic messages is included to aid in that process.

The first step is to determine if the problem is with:

1. The track (open bonds, insulated joints or broken rail)
2. Track wiring or wiring to crossing warning devices
3. The PMD-4/4R itself

Documentation

Keep the following reference documents at all PMD-4/4R installations:

1. Complete wiring diagrams showing all input and output terminals including battery supply, and all other associated wiring.
2. If available, the Program Application Worksheet and Maintenance record may be helpful.
3. Grade Crossing Location Record

Recommended Equipment

Several PMD-4/4R accessories are referred to in this chapter. These products are recommended for best operation and simplified troubleshooting. They are available from GETSGS (GE Transportation Global Signaling).

Additional Test Equipment

Digital Voltmeter and Multimeter

General Troubleshooting Techniques

The PMD-4/PMD-4R has built-in diagnostics which may be used to streamline troubleshooting problems.

1. The green Health LED located above the display.
2. Error logs and display alarms to identify system problems.
3. Display menus for detailed diagnostics like RX and Phase levels.

Connector Probing

Measure voltages at connectors by inserting test probes into connector test probe points as indicated in figure 5.1. Do not insert test probes into connector receptacles. The test probe point is shown in Figure X-X below.

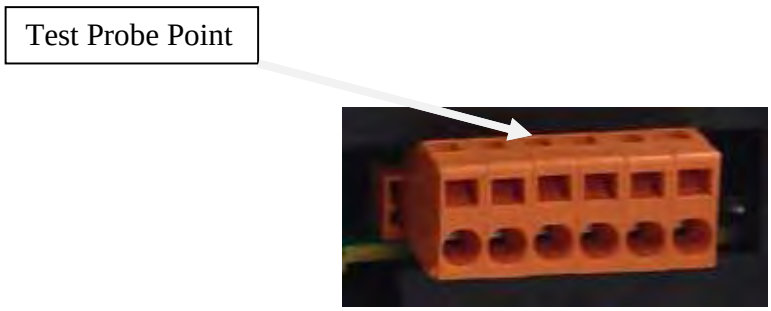


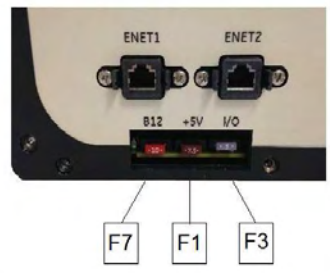
Figure X-X

General LRU Troubleshooting

The PMD-4/4R uses 12 Vdc from the supply battery. Certain internal modules operate on 12 Vdc and 5 Vdc which is supplied by the internal power supply. Always check the 12 Vdc from the supply battery as well as 5 Vdc from the power supply internal module. This can be done by the following steps:

1. To verify +12VDC supply in, use a Digital Multi-meter set to read DC voltage and measure across J1 in figure X-X below.
2. To verify +5VDC is provided to the internal power supply, use the DMM to measure across F1 in figure X-XX below.

Figure X-X



PMD-4/4R Front Panel Fuses

Figure X-XX

Supply Battery

Low supply battery levels will cause symptoms of many other failures in the PMD-4/4R. Before troubleshooting any failures, check the 12.0 Vdc battery supply voltage.

1. Using Figure X-X as a guide, check the input voltage across the B and N terminals. Verify input voltages are between 9.5 and 16.5 Vdc. If input voltage is not within tolerance, change system battery.
2. Set the meter to read AC voltage.
3. Measure the AC voltage across the B and N terminals. Verify voltage is less than 1 VAC.
4. If the AC voltage is too high, check the battery charger and correct it before continuing.

Testing with a Dummy Load

WARNING *Failure to provide protection at a crossing while using a dummy load could result in short warning times because the PMD-4/4R is no longer connected to the track. Short warning times could result in death or serious injury. Reference SRAC2.*

This procedure will isolate the PMD-4/4R from the track to determine if the problem is in the track, associated wiring, or in the PMD-4/4R.

1. Disconnect the track wires on the Track side of the MDSA (Motion Detector Surge Arrester).
2. Connect a 1186-1 or 1186-2 dummy load or equivalent inductor from the TX+ to TX- terminals.
3. Connect a jumper wire from RX+ to TX+ and another jumper wire from RX- to TX-.
4. Turn on the PMD-4/4R and adjust RX to 100.

Condition	Possible Problem Area
PMD-4/4R recovers	Look at track or wires from MDSA to track
PMD-4/4R doesn't recover	Look at PMD-4/4R or wiring from PMD-4/4R to MDSA

Troubleshooting Decision Charts

Use the Troubleshooting Decision charts to work through problems. Look at the following list for the chart which most closely matches your trouble.

Decision Chart	Page
Reduced Warning Time Decision Chart	X-X
Continuous Activation Decision Chart (MD or AX drives down)	X-X
Long Warning Time Decision Chart (Limited Predict Mode)	X-X
Ringby Decision Chart (Unit does not recover after Island passage)	X-X
Tailring Decision Chart (Unit recovers after Island passage and re-detects)	X-X

Reduced Warning Time Decision Chart (Limited Predict Mode)

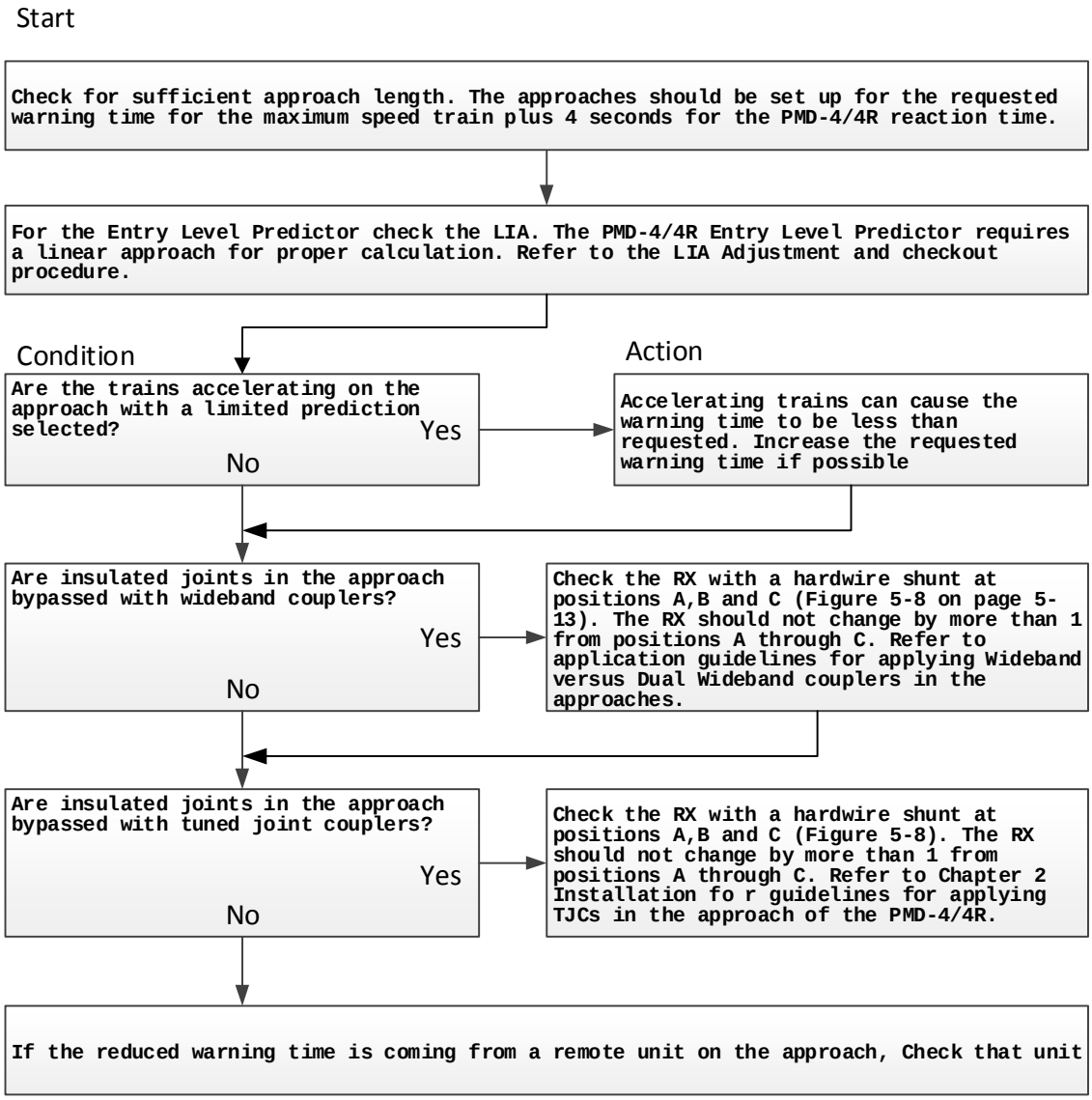

Start
Check for sufficient approach length. The approaches should be set up for the requested warning time for the maximum speed train plus 4 seconds for the PMD-4/4R reaction time.
For the Entry Level Predictor check the LIA. The PMD-4/4R Entry Level Predictor requires a linear approach for proper calculation. Refer to the LIA Adjustment and checkout procedure.
Condition
Action
Are the trains accelerating on the approach with a limited prediction selected?
Yes
No
Accelerating trains can cause the warning time to be less than requested. Increase the requested warning time if possible
Are insulated joints in the approach bypassed with wideband couplers?
Yes
No
Check the RX with a hardwire shunt at positions A,B and C (Figure 5-8 on page 5-13). The RX should not change by more than 1 from positions A through C. Refer to application guidelines for applying Wideband versus Dual Wideband couplers in the approaches.
Are insulated joints in the approach bypassed with tuned joint couplers?
Yes
No
Check the RX with a hardwire shunt at positions A,B and C (Figure 5-8). The RX should not change by more than 1 from positions A through C. Refer to Chapter 2 Installation fo r guidelines for applying TJCs in the approach of the PMD-4/4R.
If the reduced warning time is coming from a remote unit on the approach, Check that unit

Figure X-X, Reduced Warning Time Decision Chart

Continuous Activation Decision Chart

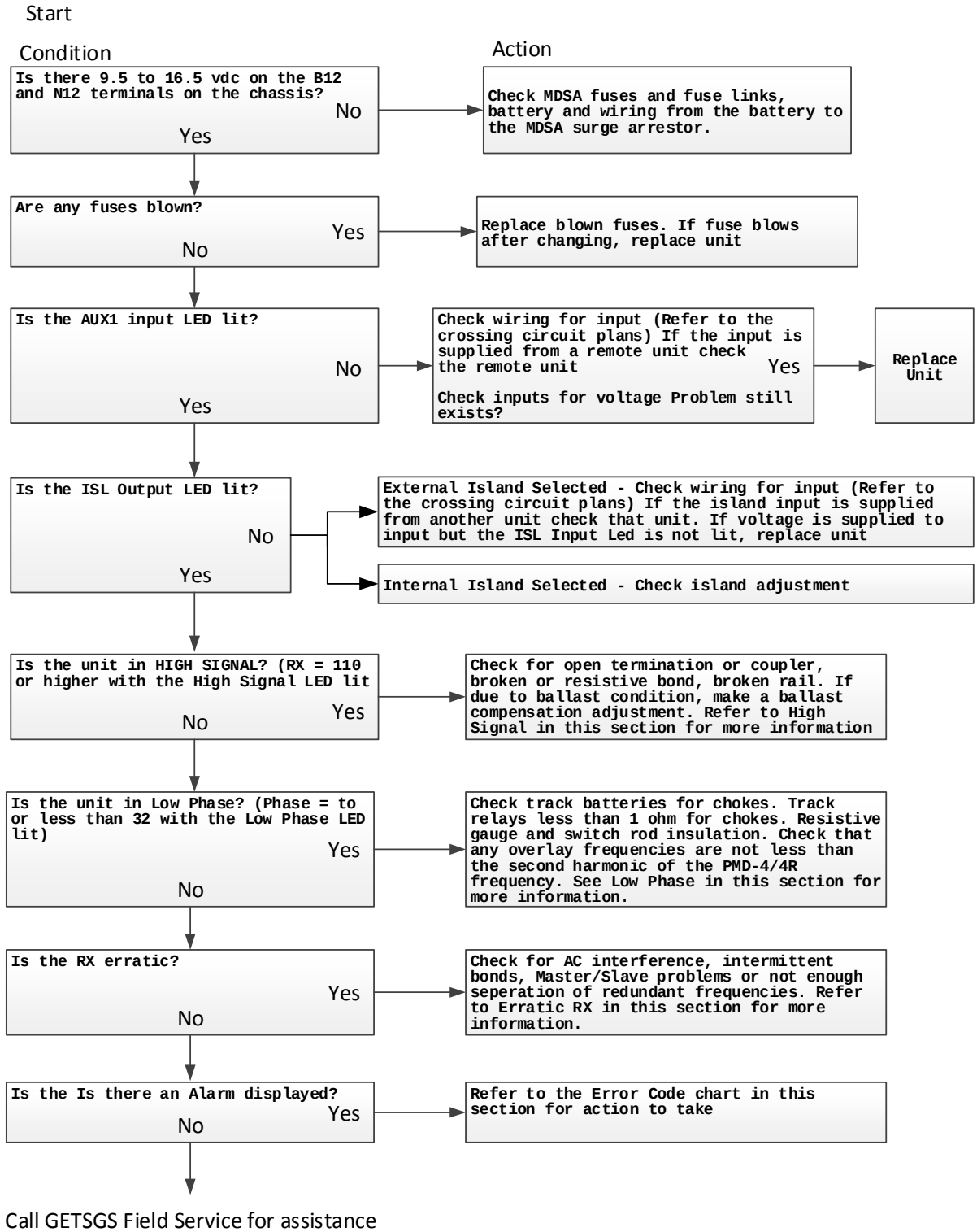

Start
Condition
Action
Is there 9.5 to 16.5 vdc on the B12 and N12 terminals on the chassis?
No
Yes
Check MDSA fuses and fuse links, battery and wiring from the battery to the MDSA surge arrestor.
Are any fuses blown?
Yes
No
Replace blown fuses. If fuse blows after changing, replace unit
Is the AUX1 input LED lit?
No
Yes
Check wiring for input (Refer to the crossing circuit plans) If the input is supplied from a remote unit check the remote unit
Yes
Check inputs for voltage Problem still exists?
Replace Unit
Is the ISL Output LED lit?
No
Yes
External Island Selected - Check wiring for input (Refer to the crossing circuit plans) If the island input is supplied from another unit check that unit. If voltage is supplied to input but the ISL Input Led is not lit, replace unit
Internal Island Selected - Check island adjustment
Is the unit in HIGH SIGNAL? (RX = 110 or higher with the High Signal LED lit
Yes
No
Check for open termination or coupler, broken or resistive bond, broken rail. If due to ballast condition, make a ballast compensation adjustment. Refer to High Signal in this section for more information
Is the unit in Low Phase? (Phase = to or less than 32 with the Low Phase LED lit)
Yes
No
Check track batteries for chokes. Track relays less than 1 ohm for chokes. Resistive gauge and switch rod insulation. Check that any overlay frequencies are not less than the second harmonic of the PMD-4/4R frequency. See Low Phase in this section for more information.
Is the RX erratic?
Yes
No
Check for AC interference, intermittent bonds, Master/Slave problems or not enough seperation of redundant frequencies. Refer to Erratic RX in this section for more information.
Is the Is there an Alarm displayed?
Yes
No
Refer to the Error Code chart in this section for action to take
Call GETSGS Field Service for assistance

Figure X-X, Continuous Activation Decision Chart

Long Warning Time Decision Chart (Limited Predict Mode)

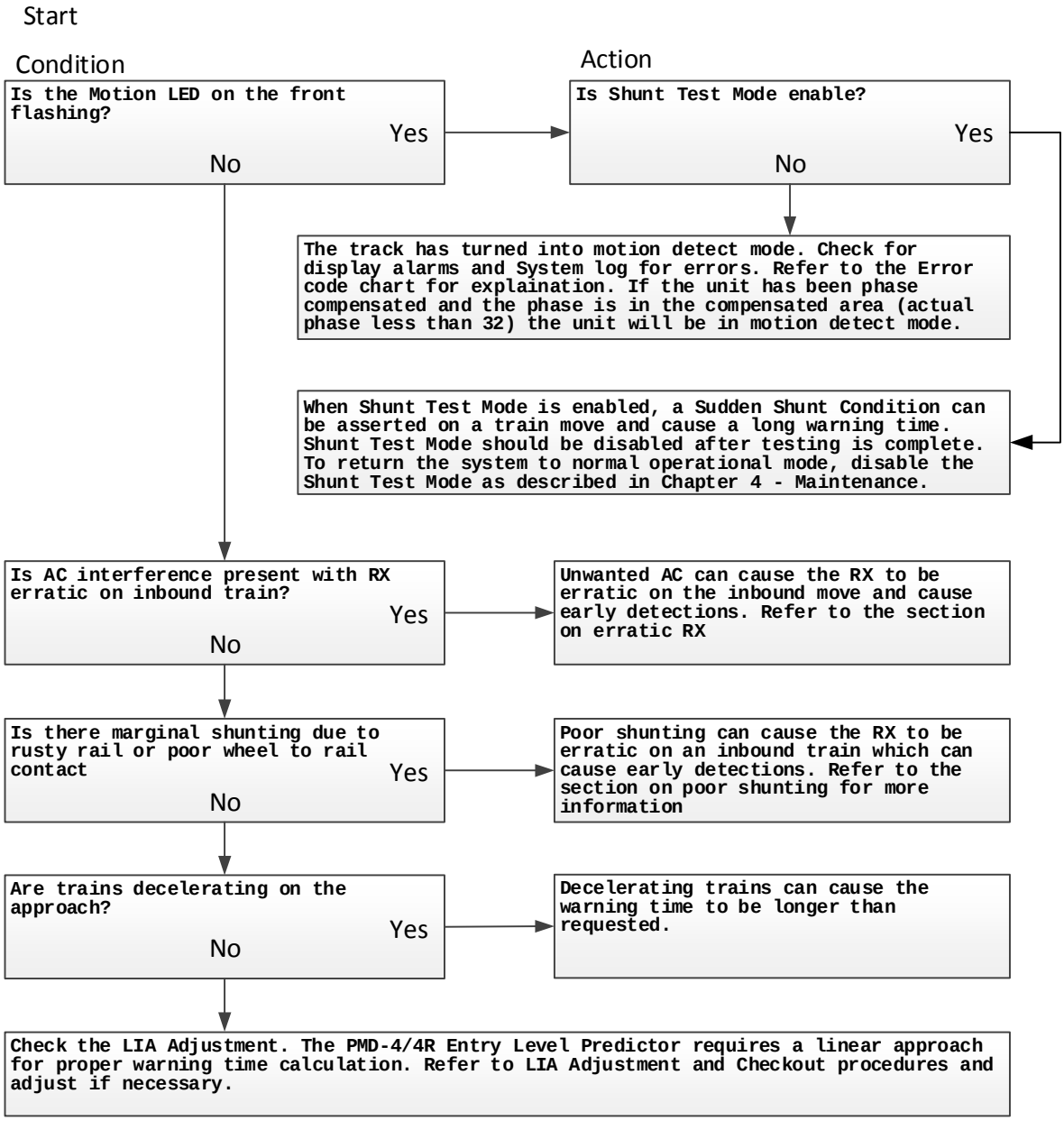

Start
Condition
Action
Is the Motion LED on the front flashing?
Yes
No
Is Shunt Test Mode enable?
Yes
No
The track has turned into motion detect mode. Check for display alarms and System log for errors. Refer to the Error code chart for explaination. If the unit has been phase compensated and the phase is in the compensated area (actual phase less than 32) the unit will be in motion detect mode.
When Shunt Test Mode is enabled, a Sudden Shunt Condition can be asserted on a train move and cause a long warning time. Shunt Test Mode should be disabled after testing is complete. To return the system to normal operational mode, disable the Shunt Test Mode as described in Chapter 4 - Maintenance.
Is AC interference present with RX erratic on inbound train?
Yes
No
Unwanted AC can cause the RX to be erratic on the inbound move and cause early detections. Refer to the section on erratic RX
Is there marginal shunting due to rusty rail or poor wheel to rail contact
Yes
No
Poor shunting can cause the RX to be erratic on an inbound train which can cause early detections. Refer to the section on poor shunting for more information
Are trains decelerating on the approach?
Yes
No
Decelerating trains can cause the warning time to be longer than requested.
Check the LIA Adjustment. The PMD-4/4R Entry Level Predictor requires a linear approach for proper warning time calculation. Refer to LIA Adjustment and Checkout procedures and adjust if necessary.

Figure X-X, Long Warning Time Decision Chart

Ringby Decision Chart (Unit does not recover after island passage)

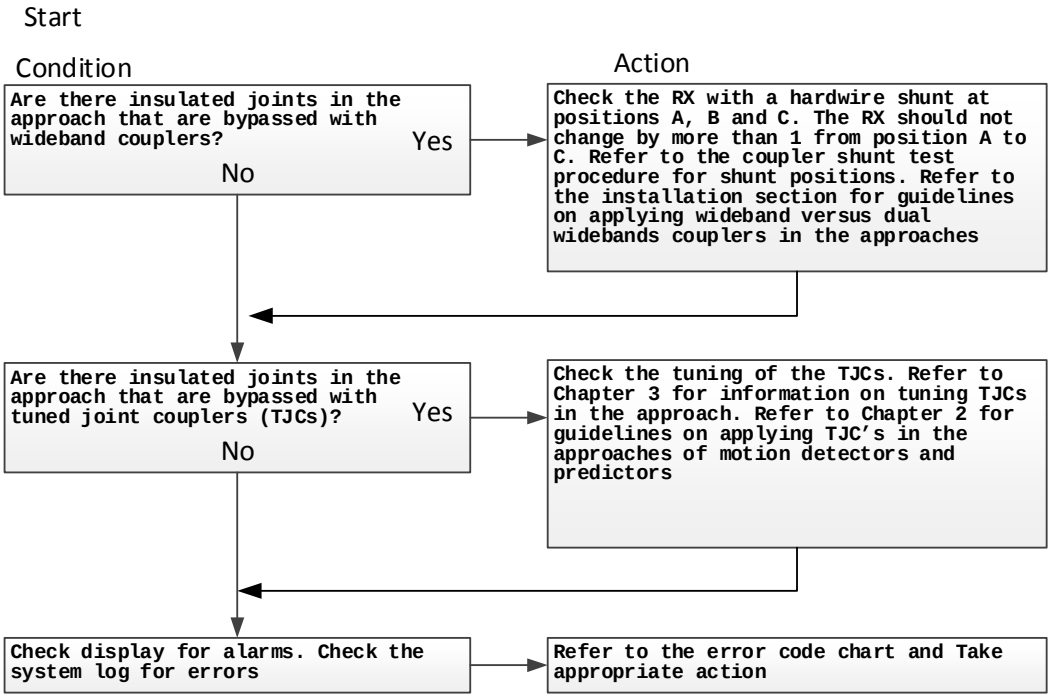

Start
Condition
Action
Are there insulated joints in the approach that are bypassed with wideband couplers?
Yes
No
Check the RX with a hardwire shunt at positions A, B and C. The RX should not change by more than 1 from position A to C. Refer to the coupler shunt test procedure for shunt positions. Refer to the installation section for guidelines on applying wideband versus dual widebands couplers in the approaches
Are there insulated joints in the approach that are bypassed with tuned joint couplers (TJCs)?
Yes
No
Check the tuning of the TJCs. Refer to Chapter 3 for information on tuning TJCs in the approach. Refer to Chapter 2 for guidelines on applying TJC's in the approaches of motion detectors and predictors
Check display for alarms. Check the system log for errors
Refer to the error code chart and Take appropriate action

Figure X-X, Ringby Decision Chart

Tailring Decision Chart (Unit recovers after island passage and re-detects)

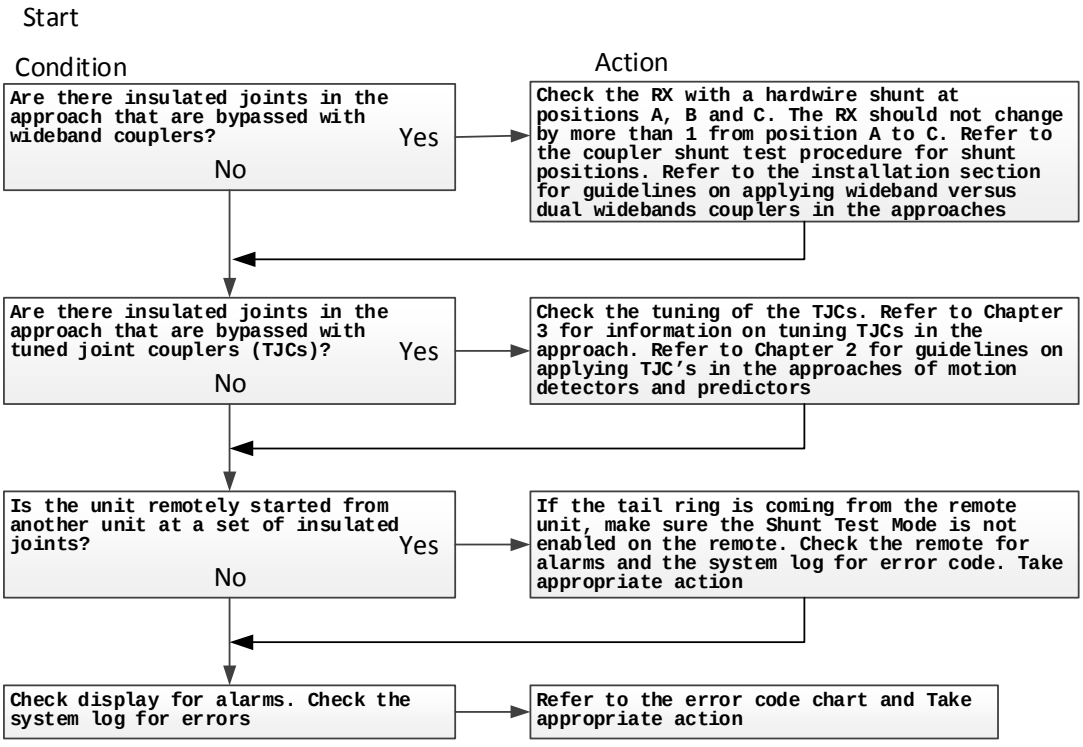

Start
Condition
Action
Are there insulated joints in the approach that are bypassed with wideband couplers?
Yes
No
Check the RX with a hardwire shunt at positions A, B and C. The RX should not change by more than 1 from position A to C. Refer to the coupler shunt test procedure for shunt positions. Refer to the installation section for guidelines on applying wideband versus dual widebands couplers in the approaches
Are there insulated joints in the approach that are bypassed with tuned joint couplers (TJCs)?
Yes
No
Check the tuning of the TJCs. Refer to Chapter 3 for information on tuning TJCs in the approach. Refer to Chapter 2 for guidelines on applying TJC's in the approaches of motion detectors and predictors
Is the unit remotely started from another unit at a set of insulated joints?
Yes
No
If the tail ring is coming from the remote unit, make sure the Shunt Test Mode is not enabled on the remote. Check the remote for alarms and the system log for error code. Take appropriate action
Check display for alarms. Check the system log for errors
Refer to the error code chart and Take appropriate action

Figure X-X, Tailring Decision Chart

High Signal Problems

High Signal (High Impedance or Open Track Circuit)

An open track circuit causes the unit to enter a High Signal condition (RX exceeds the threshold of "*110*"). High signal or unstable RX may be caused by several types of track related problems such as an open, intermittent, or resistive bond wire, termination or insulated joint coupler.

Existing Condition		**Action**
If condition exists where wide swings in ballast resistance can occur (RX exceeds 110).		Correct Ballast Compensation setting
Test	**Test Result**	**Action**
1. Place hard wire shunt 10% in front of termination.	RX drops but not to expected level.	Move test shunt in to 50% out from crossing. Note results. Go to test 2.
	RX drops close to 80 or 90.	The open is between the test shunt and the termination or the termination is bad. See Termination Shunt Test on page 5-12.
	RX does not change.	Move test shunt in to 50% out from crossing. Note results. Go to test 2.
2. Shunt at 50% out from crossing	RX reading is at approximately 50	The open is between the 50% point and the 90% point. Go to test 5.
	RX drops but not to expected level.	In a bidirectional application check the other approach. Go to test 3.
	RX does not change.	The open is between you and the crossing. Go to test 4.
3. Start shunting procedure at 50% out on opposite approach	RX does not decrease	The open is between you and the crossing. Go to test 4.
	RX decreases to approximately 50.	The open is between you and the termination. Go to test 5.
4. Move test shunt in toward crossing until RX changes significantly.		At that point look for a broken rail, bond or open coupler.
5. Move test shunt toward termination until RX changes significantly.		At that point look for a broken rail, bond or open coupler.

Termination Shunt Test

The open track circuit could be caused by a defective termination shunt. There are three types of termination shunts; hard wire, wideband, and NBS (narrow band shunt). All three types of terminations test differently.

Type of Termination	Test	Results
Hard wire	hard wire shunt at termination	No RX change should be seen
Wideband	hard wire shunt at termination	RX should decrease by no more than two.
NBS	hard wire shunt at termination	RX may decrease by as much as 25. With a NBS, the degree of decrease is affected by frequency and approach length. The lower the frequency and the shorter the approach, the more RX will decrease. If RX increases when the hard wire shunt is connected at the termination, the NBS is defective and should be replaced.

Broken or High Resistance Bond

The open track circuit could be caused by a broken or high resistance bond in the approach.

Test	Result
Shunt with a hard wire test shunt in front of and behind the suspected bond wire.	Check the RX value for changes. If the bond is good, there should be no significant change in RX from one side of a bond to the other side.

Defective Joint Coupler

An open track circuit may be caused by a defective wideband or tuned joint coupler around an insulated joint in the approach.

Test	Result
Use “Coupler Shunt Test Procedure” Figure X-X Below.	Isolate defective couplers

Coupler Shunt Test Procedure

There are two types of joint couplers in use, one of which is the wideband and the other is the TJC (Tunable Joint Coupler). The integrity of both types of couplers can be tested with the following procedure:

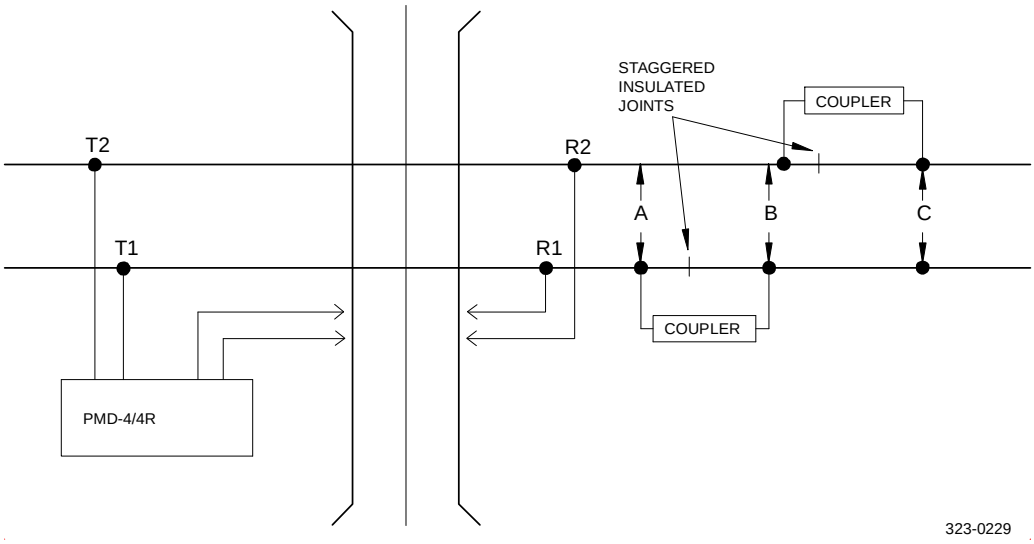


Figure X-X

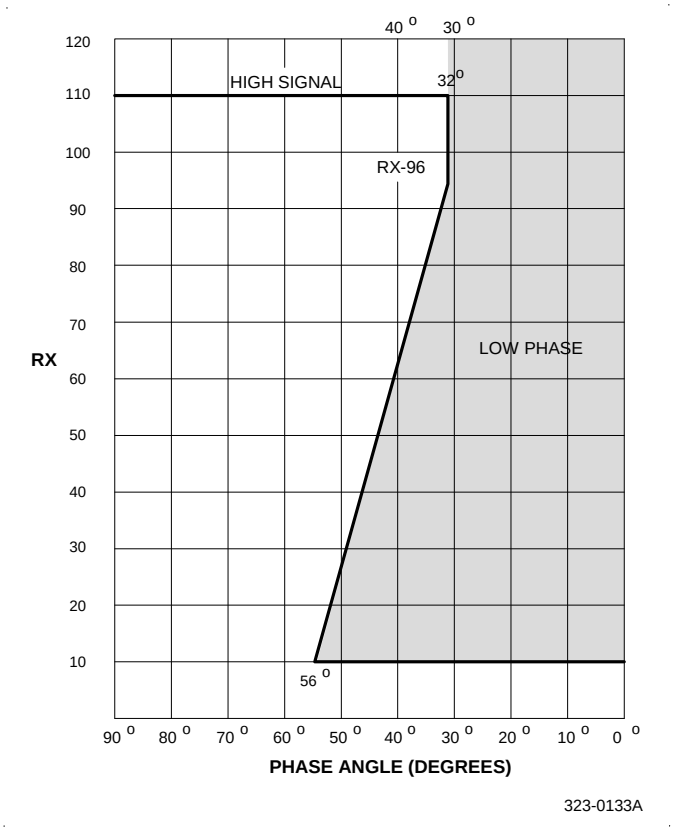
Test	**Result**
Place a hard wire test shunt on the crossing side of the joint coupler (position A in Figure 5-9).	Observe and record the RX value.
Remove the test shunt at position A.	
Place a hard wire test shunt on the opposite side of the joint coupler (position B in Figure 5-9).	Observe and record the RX value and note the RX difference from shunt A.
Remove the test shunt at position B.	
Place a hard wire test shunt on the termination side of the insulating joints (position C in Figure 5-9).	Observe and record the RX value and note the RX difference from shunt B.
Remove the test shunt at positions C.	
Action	
For TJC located in the outer two thirds of the approach:	If the RX drop across any TJC was greater than 1, the TJCs are defective or improperly adjusted. Refer to *Chapter 3 - Setup, Calibration, and Checkout* , for TJC adjustment instructions. Replace defective TJCs.
For TJC located in the inner third of the approach (motion detect mode only):	If the RX drop across any TJC was greater than 7, the TJCs are defective or improperly adjusted. Refer to *Chapter 3 - Setup, Calibration, and Checkout* , for TJC adjustment instructions. Replace defective TJCs.
Wideband Couplers:	If the RX drop across any coupler was greater than 1, that coupler could be defective. Replace defective wideband couplers.

Low Phase Problems

The PMD-4/4R will go into an Absolute Low Phase condition if the Phase angle reaches 32 degrees or less. In some cases Low Phase can occur at a higher Phase angle if the RX is lower than normal (refer to the figure X-X below). If that is the case refer to the Ballast Compensation Adjustment in this section for adjustment procedures. Some of the causes of Low Phase are listed below:

1. Open termination shunt. (The unit may also be in High Signal)
2. Open or bad insulated joint couplers in the approach. Refer to
3. Track relay in the approach, with less than 1 ohm of coil resistance that does not have a reactor installed in series with one lead to the track.
4. Gauge rods, switch rods or switch plates in the approach without insulation or with bad insulation.
5. Improper application of the PMD-4/4R frequencies when overlapping with an existing motion detector or constant warning device. Refer to the Chapter 2 - Installation for guidelines on overlapping NBS shunts.
6. AFTAC or overlay equipment with a frequency less than the second harmonic of the PMD-4/4R frequency.
7. On initial cutover, if displayed Phase is 90, check track wires to ensure they are not reversed.

If none of these suggestions prove to be the cause of the low phase and track conditions are extremely wet or the grade crossing has been salted to melt snow, follow the Phase Compensation Shunting Procedure (page X-X) to determine if phase compensation adjustments can be made.



Phase Compensation Shunting Procedure

WARNING *Failure to follow the Phase Compensation Adjustment procedure may result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

1. Adjust the Phase Compensation through the display and keypad.
    - If a Phase Compensation Adjustment has already been made, the display will show the Actual Phase and the Compensated Phase.
    - If the Actual Phase is 22 degrees or lower, **Phase Compensation Adjustment Can Not Be Made**.
    - If this is the case, the only alternative may be to use a lower track frequency. Changing the termination shunts (if Narrow Band shunts) and selecting a lower frequency are all that is required. If the approaches overlay with other crossings, follow the guidelines for overlapping Narrow Band Shunts in *Chapter 2 - Installation.*
2. Display the current RX for the approach on the display.
3. Place a hard wire Test shunt at the termination and note the RX level. If the RX drops more than 15 points, make sure the PMD-4/4R is not in a High Signal or Low Phase condition due to bad termination shunt.
4. Move the hard wire test shunt and place it in 10 percent in from the termination and note the RX level.

WARNING *To determine if Phase Compensation can be safely adjusted, place a hard wire test shunt 90 percent out on the appropriate approach. The RX must drop a minimum of 5 below what the RX is with a hard wire shunt at the termination of the approach. Adjusting Phase Compensation when not appropriate, could result in short or long warning times. Short warning times could result in death or serious injury. Reference SRAC2.*

    - <u>If the RX did not change 5 or more from step 3, Phase Compensation Adjustment Should Not Be Made.</u>
    - If this is the case, the only alternative may be to improve ballast conditions or use a lower track frequency. Changing the termination shunts (if Narrow Band shunts) and selecting a lower frequency are all that is required. If the approaches overlap with other crossings, follow the guidelines for overlapping Narrow Band Shunts in *Chapter 2 - Installation*.
5. Repeat this procedure for both approaches in a bidirectional application.

6. If the RX drops 5 or more on each approach in a bidirectional application or one approach in a uni-directional application, proceed to Changing the Phase Compensation.

Changing the Phase Compensation

1. Using the display and keypad or the Web GUI, proceed to Phase Compensation area under the Crossing Maintenance menu.
2. Note the Actual Phase angle and subtract the Actual Phase angle from 33. This is the value to enter for P-COMP (Phase Compensation). Adjustment range is 0 to 10.
3. Enter the resulting value from the previous step.
4. If the value for RX is not 100 after the Phase Compensation Adjustment, re-adjust the RX to 100.

Note: If the RX level changes more than <u>+</u> 5% after the phase returns the normal level, re-adust the ballast compensation as described below.

Ballast Compensation (BC) Problems

The BC (Ballast Compensation) adjustment counteracts variations in the RX due to changing ballast conditions. To provide consistent warning times and accurate train speed data, the RX should stay as close as possible to

100 in all ballast conditions.

- The Ballast Compensation should be adjusted when the RX changes by a value of 5 or more in either direction, from 100, due to changes in ballast conditions.

- The highest stable RX and the lowest stable Phase value are shown on the display to assist in determining the correct Ballast Compensation Adjustment.

- Record the adjustments required by changing ballast conditions in the History Log (located at the front of the manual) to aid future troubleshooting. **The History Log must be reviewed periodically to determine if Ballast Compensation is required.** Refer to the front of this manual for an example of this log.

- If the RX increases when the Phase angle decreases and the RX decreases when the phase angle increases, decrease the BC value by a factor of 2 for every RX change of 1.

For example: If the BC value is 140 and the RX increases to 110 (110 - 100 = 10) when the Phase angle decreases (deteriorating ballast) and the RX decreases to 100 when the Phase angle increases (improving ballast), decrease the BC value from (10 x 2 = 20) 140 to 120.

- If the RX decreases when the Phase angle decreases and the RX increases when the Phase angle increases, increase the BC value by a factor of 2 for every RX change of 1.

  For example: If the RX decreases to 85 (100 - 85 = 15) when the Phase angle decreases (deteriorating ballast) and the RX increases to 100 when the Phase angle increases (improving ballast), increase the BC value from (15 x 2 = 30) 140 to 170.

- After adjusting the Ballast Compensation setting, readjust the RX to 100.

Changing the Ballast Compensation

1. Using the display and keypad or the Web GUI, proceed to Ballast Compensation area under crossing maintenance menu.
2. Key in the desired value as described above.

After the ballast compensation adjustment has been made, complete the following procedure:

1. Read the RX level for the track that was adjusted.
2. Readjust the RX to 100 if necessary.
3. If the RX level was adjusted more than + 5%, check and adjust Linearity and NBS compensation if required.
4. Continue to monitor and record the RX value over a period of time as ballast conditions change to determine if any further adjustment of Ballast Compensation is required.

Erratic RX Problems

Erratic RX - Possible Causes	
Track Related Causes	**RX floats up and down (cyclical manner)**
Intermittent Bond Wire	AC Interference
Termination	Redundant Frequency Separation
Insulated Joint Coupler	Master/Slave Problems
	Coded DC

AC Interference

AC interference can cause the RX to change with a rhythmic pattern. To determine if AC is causing the unstable RX

1. Connect a hard wire shunt across the track near the NBS termination.
2. If the RX stabilizes, the problem is most likely AC noise related, particularly if the PMD-4/4R frequency is below 267 Hz. The source of most noise frequencies is from 60 Hz or multiples of 60 Hz.
3. Use a frequency selective voltmeter or spectrum analyzer to determine what frequencies may be interfering with the PMD-4/4R frequency.

Refer to the following chart for rail to rail voltage levels in decibels (relative to 1 Vrms) that can interfere with PMD-4/4R frequencies.

	Normal Approach					Short Approach					Very Short Approach				
Frequency	**60**	**120**	**180**	**240**	**300**	**60**	**120**	**180**	**240**	**300**	**60**	**120**	**180**	**240**	**300**
86	25	24	29	29	29	19	18	29	29	29	11	10	22	26	26
114	29	-45	24	29	29	27	-51	18	27	29	19	-59	10	19	25
135	29	-13	25	29	29	29	-19	19	29	29	26	-27	11	22	26
151	29	14	-12	27	29	29	8	-18	21	29	25	0	-26	13	25
156	29	18	-15	26	29	29	12	-21	21	29	25	4	-29	13	25
172	29	28	-44	27	29	29	22	-50	21	27	25	14	-58	13	19
210	29	29	4	-18	18	29	25	-2	-24	12	21	17	-10	-32	4
211	29	29	10	-13	19	29	29	4	-19	13	21	21	-4	-27	5
230	29	29	29	-48	29	29	29	29	-54	23	22	22	22	-62	15
267	29	29	29	4	3	29	29	24	-2	-3	22	22	16	-10	-11
285	29	29	29	26	-47	29	29	29	20	-53	23	23	23	12	-61
326	29	29	29	25	-5	29	29	29	19	-11	24	24	24	11	-19
348	29	29	29	29	14	29	29	29	29	8	24	24	24	21	0
392	29	29	29	29	24	29	29	29	29	18	24	24	24	22	10

Possible Causes of AC Interference

- Imbalance between rails to ground caused by faulty surge arresters
- Bad insulated joints
- Grounded track wires.

To check for an imbalance between rails to ground:

1. Connect the selective voltmeter between each rail and ground to measure the 60 Hz voltage level.

2. If the 60 Hz levels are more than 2 or 3 decibels different, the rail with low AC may be grounded. If a frequency selectable voltmeter or spectrum analyzer is not available a digital voltmeter may be substituted. If differences greater than .5 volts AC between each rail and ground be seen, the rail with the low AC voltage may be grounded. Check arresters and track wires connected to that rail.

To check for grounded arresters:

1. Temporarily remove track arresters, one at a time, at the location and adjacent crossing cases and

signal locations in the block.

2. If the imbalance goes away, change that arrester.

Another cause of AC interference is induced AC voltage from power distribution lines running parallel to the tracks. In some cases a 60 Hz (1133A-2) or 180 Hz (1133A-2) shunt may be placed on the track to shunt the interfering frequency.

WARNING *The 180 Hz shunt cannot be connected within the approach or on the track terminals of a HXP using frequencies of 326 Hz or below. The 60 Hz shunt cannot be connected within the approach or on the track terminals of a HXP using frequencies of 210 Hz or below.Failure to observe this warning may result in short warning times. Reference SRAC2.*

Poor Wheel-to-Rail Contact

In order for the PMD-4/4R when configured in limited predict mode to calculate accurate warning time, the RX must change linearly from the approach to the crossing. Linearity of RX can be adversely affected by the presence of AC noise or wheel-to-rail contact interference due to contaminants like rust, chemicals, etc.

Note: *Track linearity variations, commonly found in railroad tracks, may cause actual warning time variations to be greater than + or -10%. Warning time accuracy is also affected by variations in actual train speed, which occur after activation of the warning system*

Redundant Frequencies

PMD-4/4Rs operating at the same frequency on a common track must be separated by at least one hard wire termination shunt or a wideband shunt/coupler.

If narrow band shunts of the same frequency are used for approach terminations:

1. They must be separated by at least 2,000 feet when using a frequency of 211 Hz or lower
2. 1,000 feet when using frequencies of 267 Hz and 285 Hz
3. 500 feet when using frequencies of 326 Hz and above.

One set of un-bypassed insulated joints (located between terminations) will substitute for the termination separation distance.

Master/Slave Operation

PMD-4/4Rs of the same frequency operating on adjacent tracks or back to back at a set of insulated joints, should be Master/Slaved to prevent the RX from floating up or down.

Diagnostic Messages

The following table is used to assist the Maintainer when troubleshooting the PMD-4/4R. Diagnostic error messages are listed in alphabetical order.

An example of the error message is provided in the first column with the suggested action to taken in the second column. The characters m, n, x, y, z can be either numeric or text embedded in the message.

If the error message displayed in the error log is not one of the following then please contact GETSGS

Customer Support.

Diagnostic Messages	Action
Redundant Module Pair Fail-Over: S#-Active S#-Inactive	Track module transferred to a redundant slot. Message tells which slot is active and which is inactive 1) If this occurred due to a manual switchover or disconnection of track or I/O connections, no action required. 2) If this was unexpected, replace the Unit if error continues
Application Selection Defaulted By System	Select an Application or reinstall the Application
Slot #, XTI Missing"	Replace Unit
Slot #, ATC 1, Mdr #, A/B Warning Time Comparison mismatch	Warning time between vital processors disagree. Replace unit
Slot #, ATC 1, Error Reading RX	Error in reading RX for the specified approach track circuit. Replace Unit
Slot #, ATC 1, A/B Kinetics Comparison mismatch	Processors disagree. Replace Unit
Slot #, ATC 1, Operating Mode Changed from CW<0x0> to MD<0x10>: LoPhs/Rx	Applies to Limited Predict Mode. Approach turned to motion detect due to Low Phase Low RX condition. Refer to Troubleshooting Low Phase problems
Slot #, ATC 1, Operating Mode Changed from CW<0x0> to MD<0x20>: UcPhs<Lmt	Applies to Limited Predict Mode. Approach turned to motion detect due to phase in compensated area. Refer to Troubleshooting Low Phase problems
Slot #, ATC 1, Slave Delta Duty Cycle of # Detected. # Allowed.	Slave duty cycle out of range. Check master slave wiring. Check Master unit
Slot #, ATC 1, Master Delta Duty Cycle of # Detected. # Allowed.	Master duty cycle out of range. Check master slave wiring
Slot #, ATC 1, Auto-Calibration Timed Out	Re-calibrate Approach
Slot #, ATC 1, Auto-Calibration Cannot Achieve Target RX"	Check approaches and termination shunts. Re-calibrate Approach
Slot #, ATC 1, XTI Health Transitioned From ***Value*** To ***Value***	Message can occur on startup or when approach is transferred in PMD-4R as the track module recovers.

Diagnostic Messages	Action
Slot #, ATC 1, XTI became Healthy, resetting data	Message can occur on startup or when approach is transferred in PMD-4R as the track module becomes healthy.
Slot #, ATC 1, Too much raw data-#	Replace Unit
Slot #, ATC 1, Pass list error ##	Replace Unit
Slot #, ATC 1, Invalid Object Specified	Replace Unit
Slot #, ATC 1, Calibration Successful	Approach successfully calibrated
Slot #, ATC 1, Calibration Required	The approach track circuit has not been calibrated yet and needs calibration
Slot #, ATC 1, Approach Frequency Changed From # Hz To # Hz	Approach track frequency has been changed
Invalid EPROM Type = (%s)	Change SSM module
Approach parameters set to corruption default	Re-install Application and setup unit
ATK Invalid EPT Checksum Calc= nnnn Stored= mmmm	Re-install Application and setup unit
ATK Invalid EPT CRC Calc=nnnn Stored= mmmm	Re-install Application and setup unit
SSM Module Removed	Reinstall SSM module with correct Application
Slot #, ATC 1, Calibration Failed While Latching Max Transmitter Voltage Amplitude	Check for AC interference problems. Re-calibrate approach
Executive EPROM CRC Failure	Replace Unit
Executive RAM Test Failure	Replace Unit
Hi Signal Detected	See Troubleshooting - High Signal Problems section
Isl 1, Slot #, Calibration Required	Calibrate the Island
Isl 1, Slot #, Calibration Timed Out	Calibrate the Island
Isl 1, Slot #, Frequency Set To Zero	Set the Island frequency
Isl 1, Slot #, Transmit Gain Zero At Startup	Calibrate the Island
Isl 1, Slot #, x Out Of Range. Expected y	Check wiring, if okay then replace Unit
Isl 1 Slot #, x Set To Corrupt Default	Setup Island parameters and Calibrate the Island
Isl 1, Slot #, XTI DSP Error #	Replace Unit
Isl 1, Slot #, %s %u Out Of Range. Expected %u	Check wiring, if okay then replace Unit
Isl 1, Slot #, Invalid Stage	Replace Unit
Isl 1, Slot #, Failed XTI DPRAM Write/read	Replace Unit

Diagnostic Messages	Action
Isl 1, Slot #, AB Cross Check Failure: # #	Replace Unit
Island Parameters Defaulted	Setup Island parameters and Calibrate the Island
Slot #, ATC 1, Decreasing Phase Fault Condition has occurred	Check for resistive bond, mistuned TJC in the approach, mis-applied wideband coupler in the approach
User App Chg: VApp From # To #; NVApp From # To #	User has changed the application program
Multiapp User EE Can't Recover	Change SSM Module
NSM Output # Over-Current Error: Voltage FB=x OverCurrent FB=y	(PMD-4R Only) Replace Unit
NSM Output # Over-Current Possible Personality Module Failure: Slot x	(PMD-4R Only) Replace Unit
NSM Output # Voltage Correspondence Error: Voltage FB=x OverCurrent FB=y	(PMD-4R Only) Replace Unit
Slot #, ATC 1, Unexpected Sequence Number Received: xxxx	Island interference or Fault setting issue, change island frequency and/or island fault delay setting to correct
Slot #, Output # off when should be on	Replace Unit
Slot #, Active XTI Battery Not present x	Check battery and connections. Replace unit
Slot #, ATC 1,A/B Rx and Phase Comparison mismatch	Replace Unit
Slot #, ATC 1,Approach Release Fault Condition has occurred	RX value did not rise above the Approach release setting on outbound approach. Check approach for a shorted condition. This condition can occur if a train stops on the outbound approach when the Approach release option is used.
Slot #, ATC 1,Calibration Required	Calibrate the approach. See Approach Setup section
Slot #, ATC 1,Cross Check Failure. MS Frequency: x	Check Master/Slave wiring. Replace Unit if nothing is found
Slot #, ATC 1, Cross Check Failure. Phase: x	Check track wires and AC interference. Replace Unit if nothing is found
Slot #, ATC 1, Cross Check Failure. RX Voltage: x	Check track wires and AC interference. Replace Unit if nothing is found
Slot #, ATC 1, Cross Check Failure. TX Current: x	Check track wires and AC interference. Replace Unit if nothing is found
Slot #, ATC 1, Cross Check Failure. TX Voltage: x	Check track wires and AC interference. Replace Unit if nothing is found

Diagnostic Messages	Action
Slot #, ATC 1,MAX_TV_AMPLITUDE not latched at calibration	Re-perform Approach Gain Calibration (RX Adjust)
Slot #, ATC 1,Cross Check Failure. Phase: x	Replace Unit
Slot #, ATC 1,Cross Check Failure. RX Voltage: x	Replace Unit
Slot #, ATC 1,Cross Check Failure. TX Current: x	Replace Unit
Slot #, ATC 1,Cross Check Failure. TX Voltage: x	Replace Unit
Slot #, ATC 1,Excessive Track Noise Detected (High Variance)	Verify the Approach Length setting. Check for AC interference. Refer to troubleshooting section AC Interference. Check track wire connections
Slot #, ATC 1,Error Reading RX	Replace Unit
Slot n ATC 1,False Shunt Fault Condition has occurred	A False Shunt condition has occurred on the approach. Check approach for a short.
Slot #, ATC 1,High Signal Fault Condition has occurred	See Troubleshooting - High Signal Problems section
Slot #, ATC 1,Low Phase Fault Condition has occurred	See Troubleshooting – Low Phase Problems section
Slot #, ATC 1,Mdr x Transmitter Detect TTC rang the crossing	Check track wiring and connections to the rail and MDSA
Slot #, ATC 1,Pass list error x	Replace Unit
Slot #, ATC 1,Reversed Lead Wires Fault	Check track wires from MDSA to the track and from the MDSA to the Unit. Verify twisted pairs are correct.
Slot n, ATC 1, Resistive Shunt Fault	This error could occur on Island calibration. If this is the case no action required. If not check for resistive shunt in the approach.
Slot #, ATC 1,Slave Freq Mismatch. x Hz wsb y Hz.	Verify Master/Slave Frequency settings
Slot #, ATC 1, Transmitter Check Fault Condition has occurred:#	Check track wires for resistive connections. Check for resistive bond in the island. Check TCI and TCA adjustment.
Slot #, ATC 1,Transmitter Gain Changed From x To y; Need calibration	Normal/Short/Very Short Gain changed Calibrate the Approach.
Slot #, ATC 1,TX Current # mA Too High. x mA Allowed.	Re-calibrate approach. Check terminations. Replace unit
Slot #, ATC 1,TX Current # mA Too Low. x mA Allowed.	Check track connections and termination shunts. If this error is generated when calibrating the RX, set the frequency to a lower value, then go back to the original frequency and calibrate.

Diagnostic Messages	Action
Slot #, ATC 1,TX Freq Out Of Tolerance. x Hz wsb y Hz.	Replace Unit
Slot #, ATC 1,TX Voltage # mV Too High. x mV Allowed.	Check track connections and wiring. Replace Unit if okay
Slot #, Inactive XTI Battery Not Reported	Check Battery and connections
Slot #, Inactive XTI Battery Present	Check Battery and connections
Slot #, ITC 1 Island Down Error	Check island circuit Replace unit if okay
Slot #, NSM Missing	Replace Unit
Software Reset - RSR = x PDR = y	Replace Unit
Vital Configuration Setting Initialized From ATK Defaults	Verify and set Vital Configuration settings
Vital Timers Initialized From ATK Defaults	Verify and set Vital Timer settings

Chapter 6 – CDU Navigation

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Chapter 6 – Display Navigation

Keypad and Display

The keypad and display provides the main interface between the PMD-4/4R system and the user. A 17 button keypad and the display allows for easy access to system setup, maintenance, and diagnostic utilities.

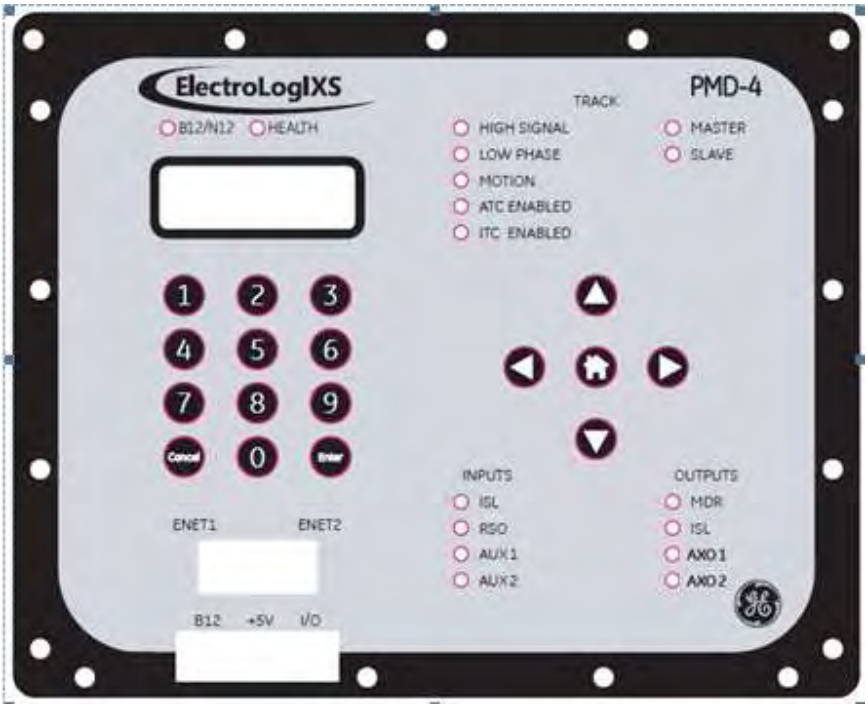


Figure X-X, The Keypad and Display.

The status indicators provide a visual indication of system status. The HEALTH LED is illuminated when the system's CPUs are communicating and operating normally. The HEALTH LED will be extinguished during system resets or when a CPU is locked up. The 5V PWR LED illuminates when the CPS (Central Power Supply Module) output is within tolerance.

Keypad Functions

The Keypad is divided into three groups; 10 alphanumeric keys marked '0' through '9', two keys marked 'CANCEL' and 'ENTER', four directional arrow keys and one Home key.

Numeric Keys

Numeric keys are used for numeric input. In case a True/False or On/Off status is expected, the '0' and '1' keys are used. The '0' key will select either False or Off, and the '1' key will select either True or On.

If a numeric entry is expected, the cursor will move one position to the left after a key is pressed.

Arrow Keys

As long as the system is in the Directional Mode the arrow keys can be used to navigate through the menu tree. Pressing the Right Arrow key displays the next menu item to the right (the menu will loop around to the first menu of the same level if the last menu is in the display). Pressing the Left Arrow key displays the next menu to the left. Pressing the Down Arrow key displays the menu of the next lower level menu item unless the lowest level is currently displayed in which case, the menu will loop to the top of the menu. Pressing the Up Arrow key displays the menu of the next higher level item. If the highest level menu item is currently displayed, the Up Arrow key is disabled.

Pressing the Right and Left Arrow keys simultaneously activates the “Local Home” that allows the user to jump to the Functional Heading for the menu being displayed.

Pressing the Up and Down Arrow keys simultaneously activates the “Global Home” that allows the user to jump to the PMD-4/4R Home Menu.

Using the Menus

The display menu system is a “tree” of menu items. Functional Headings are located at the top of the tree and are arranged in a left to right fashion. Subheadings, data display/select items appear under the Functional Headings. Data prompts are located under data display/select items.

Data Prompt

The data prompt s displayed on the display depends on the type of data to be entered.

`Enter Value>`	Expects a numeric entry and shifts the cursor to the right with every numeric key pressed.
Press Up and Down Arrow Keys >	These keys are used to increase or decrease a value setting or to navigate the CDU menu.
`Erase : Press '0'>`	To erase an error or data logs press 0.
`Y/N press 1/0 >`	For Yes press 1. For No press 0.

Operating Modes

The CDU has two modes of operation; the Directional Mode and the Edit Mode. The Directional Mode is used to navigate through the menu tree. While in the Directional Mode, the user cannot change any values. The Edit Mode is used to modify values and setup parameters. While in the Edit Mode, the user cannot navigate through the menu tree.

Edit Mode

The Edit Mode allows the operator to modify system parameters and setup the PMD-4/4R. The ENTER key is used edit/enter functions for items indicated with an "*". To change a displayed value, press the ENTER key once. After changing the value and verifying that the value is correct, the new value is saved when the ENTER key is pressed again. While in the Edit Mode, the CANCEL key is used for canceling the current entry. If the CANCEL key is pressed, the current entry is canceled and the user is returned back one menu.

Short Cut Keys

The PMD-4/4R has the following short cut keys:

Local Home:	By simultaneously pressing the Right and Left Arrow keys the display jumps to the Functional Heading of the menu being displayed.
Global Home:	By simultaneously pressing the Up and Down Arrow keys or pressing the Home button will jump to the PMD-4/4R Home Menu.
High/Low Clear:	From the home menu, if the 1 key is pressed and held for 5 seconds, the high signal/low phase memory will be reset if the condition is no longer occurring and the front panel indicators cleared.
Shunt Test Mode:	From the home menu, if the 2 key is pressed and held for 5 seconds, the unit will be changed to shunt test mode enabled. The menu will revert to the shunt test mode area and enabled will be displayed. The user can then disable the mode from that menu when they are done testing.
XTI Transfer:	For a PMD-4R only, From the home menu, if the 3 key is pressed and held for 5 seconds, the unit will change the active XTI-1S from Normal to standby or vice versa. If the 3 key is released and pressed for another 5 seconds, it will transfer again the opposite way.
Sleep Mode:	If the home button is held down for 5 seconds, the display will go into sleep mode. In sleep mode the display will be dark with no data displayed. If any button is pressed while in sleep mode, the unit will display the home screen again. If no keys are pressed for 30 minutes, the unit will go into sleep mode automatically.

Home Menu

Pressing the Home button from any menu will get the user back to the Home Menu. The Home Menu will show the Site ID, current Date and Time, Current RX and Phase with gain and adjusted gain. The current alarm if any will be displayed on the bottom line. The Home menu is shown in Figure X-X below

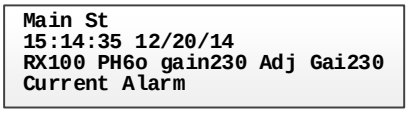


Figure X-X, Home Menu

Top Level Menu

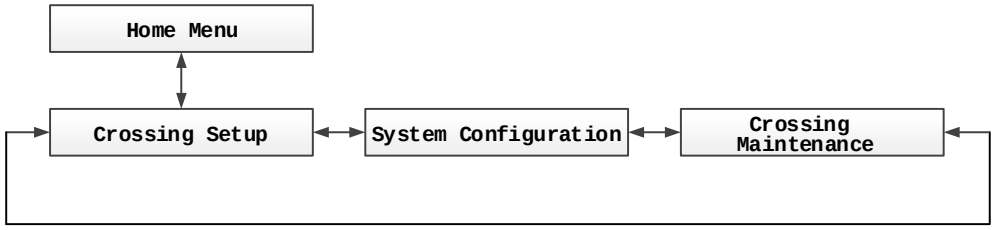


Figure X-X,Top Level Menu

Crossing Setup Menu

Pressing the Down Arrow button from the Home Menu will get the user to the Crossing Setup Menu shown in Figure X-X below.

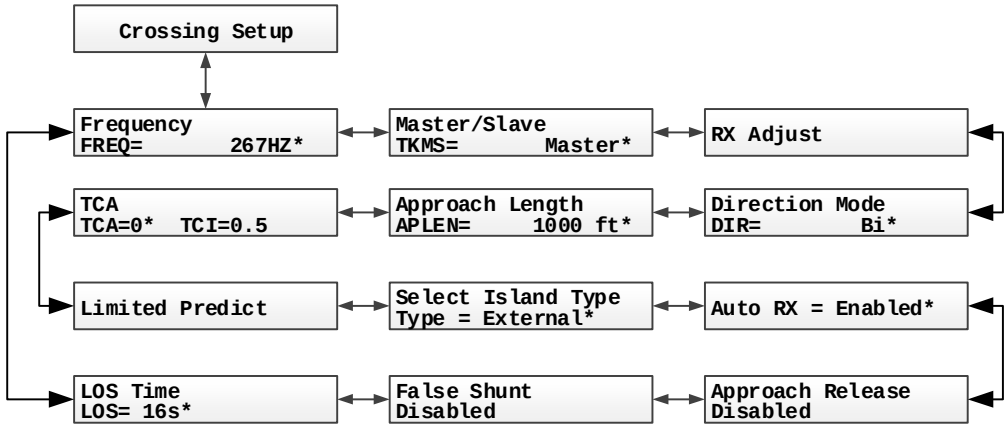


Figure X-X

Frequency Menu

Pressing the Down Arrow button from the Crossing Setup Menu will get the user to the Frequency Menu. This is where the approach frequency is entered. The Frequency menu is shown in Figure X-X below.

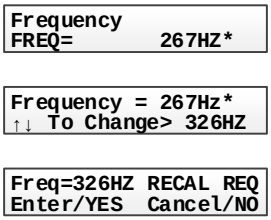


Figure X-X

Master/Slave Menu

Use the following menu shown in Figure X-X below to set the Master/Slave setting.

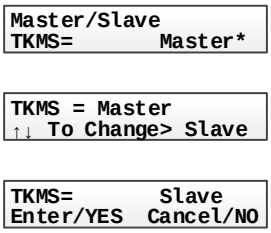
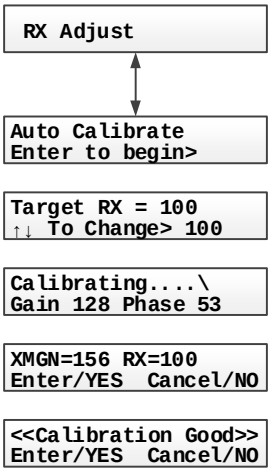


Figure X-X

RX Adjust Menu

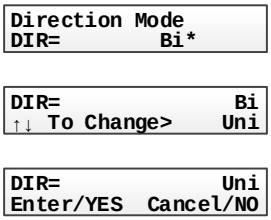
Use the following menu shown in Figure X-X below to adjust the RX value.



. **Figure X-X**

Direction Mode Menu

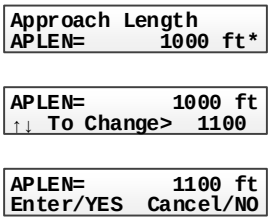
Use the following menu shown in Figure X-X below to set the direction mode to either Uni-Directional or Bi-Directional.



. **Figure X-X**

Approach Length Menu

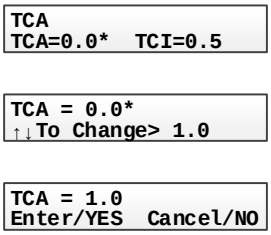
Use the following menu shown in Figure X-X below to set the approach length parameter.



. **Figure X-X**

Transmitter Check Adjustment Menu

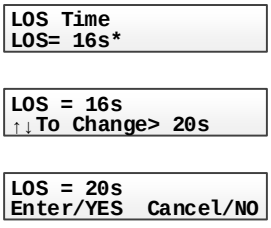
Use the following menu shown in Figure X-X below to adjust the transmitter check parameter.



. **Figure X-X**

Loss of Shunt Time Menu

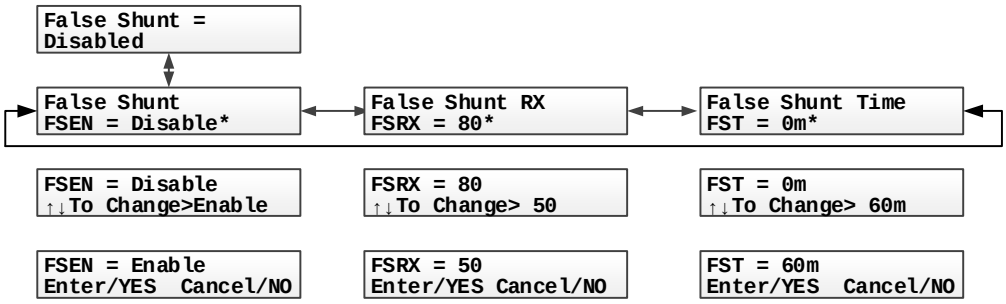
Use the following menu shown in Figure X-X below to adjust the loss of shunt parameter.



. **Figure X-X** LOS Menu

False Shunt Menu

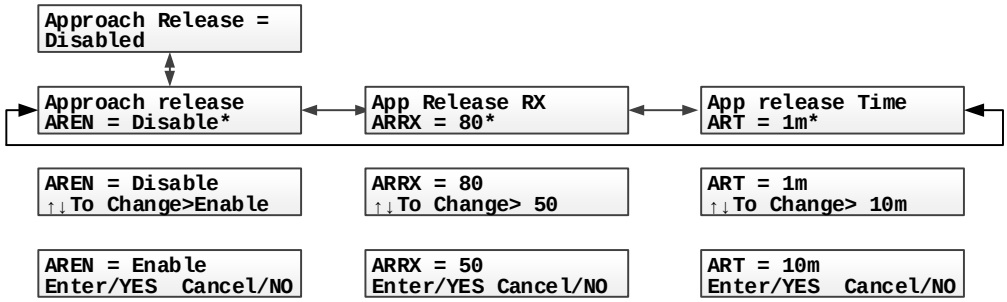
Use the following menu shown in Figure X-X below to adjust the false shunt parameter.



. **Figure X-X**

Approach Release Menu

Use the following menu shown in Figure X-X below to adjust the approach release parameter.



. **Figure X-X**

Auto RX Menu

Use the following menu shown in Figure X-X below to adjust the Auto RX parameter.

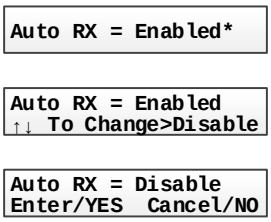


Figure X-X

Island Setup Menu Internal Island Selected

Use the following menu shown in Figure X-X below to set up the Internal island. When Internal Island is selected, the Internal island setup menu will be made available.

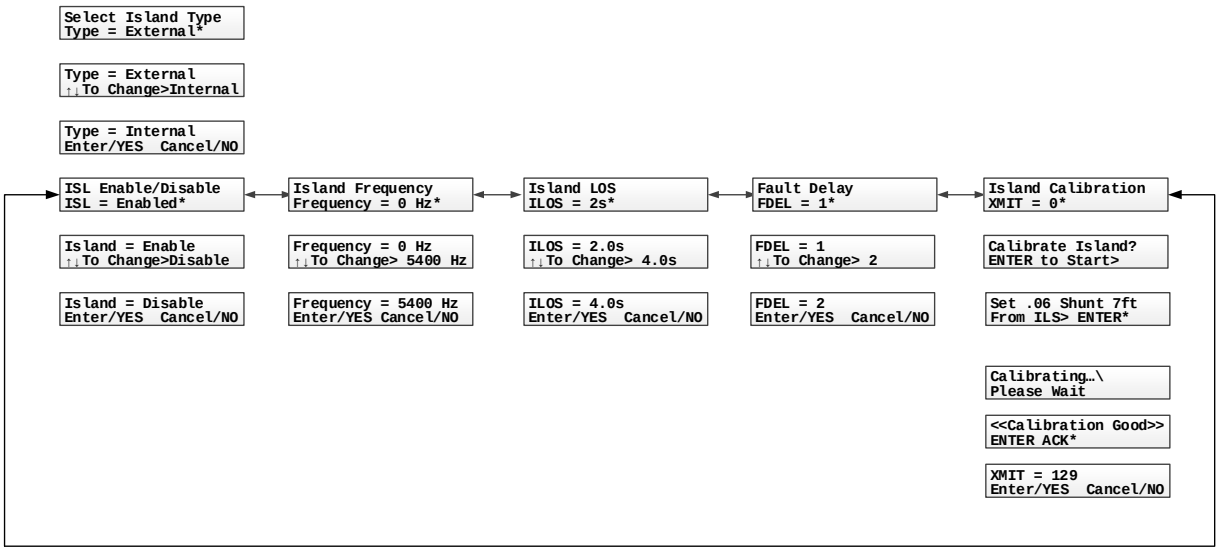


Figure X-X Island Setup Menu

Island Setup Menu External Island Selected

Use the following menu shown in Figure X-X below to set up the External Island. When External Island is selected, the Internal island setup menu will not be made available. The island input will control the island operation.

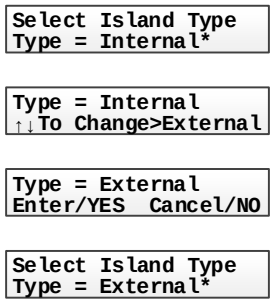


Figure X-X

Limited Predict Menu (Selective Function)

Use the following menu shown in Figure X-X below to set the limited predict mode. Limited predict will be available if the selective function has been enabled in the Crossing Maintenance Menu.

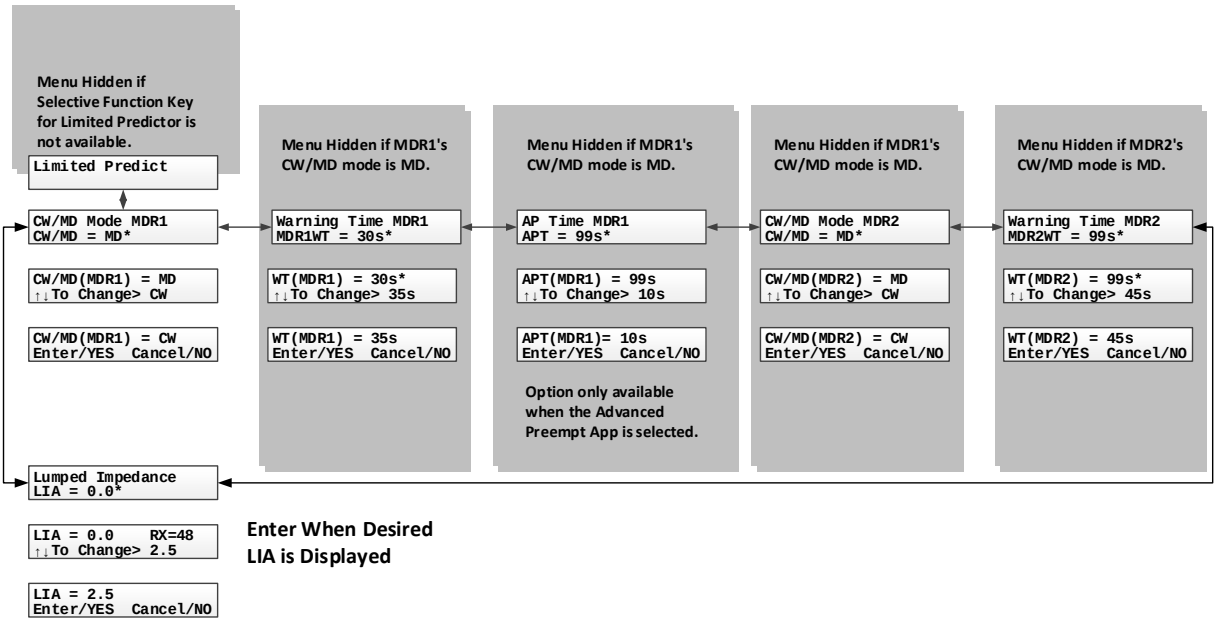


Figure X-X

System Configuration Menu

The following Figure X-X below shows the menu structure for the System Configuration Menu.

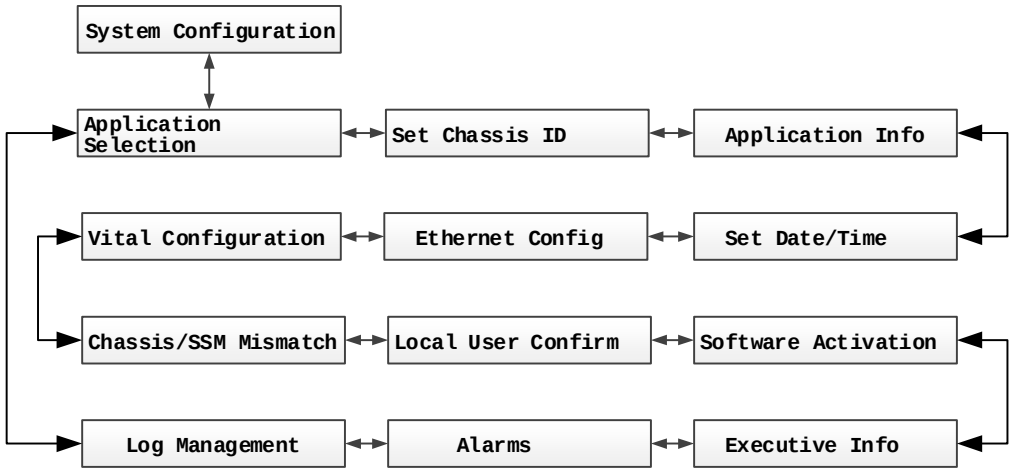


Figure X-X

Application Selection Menu

Use the following menu shown in Figure X-X below to select the application.

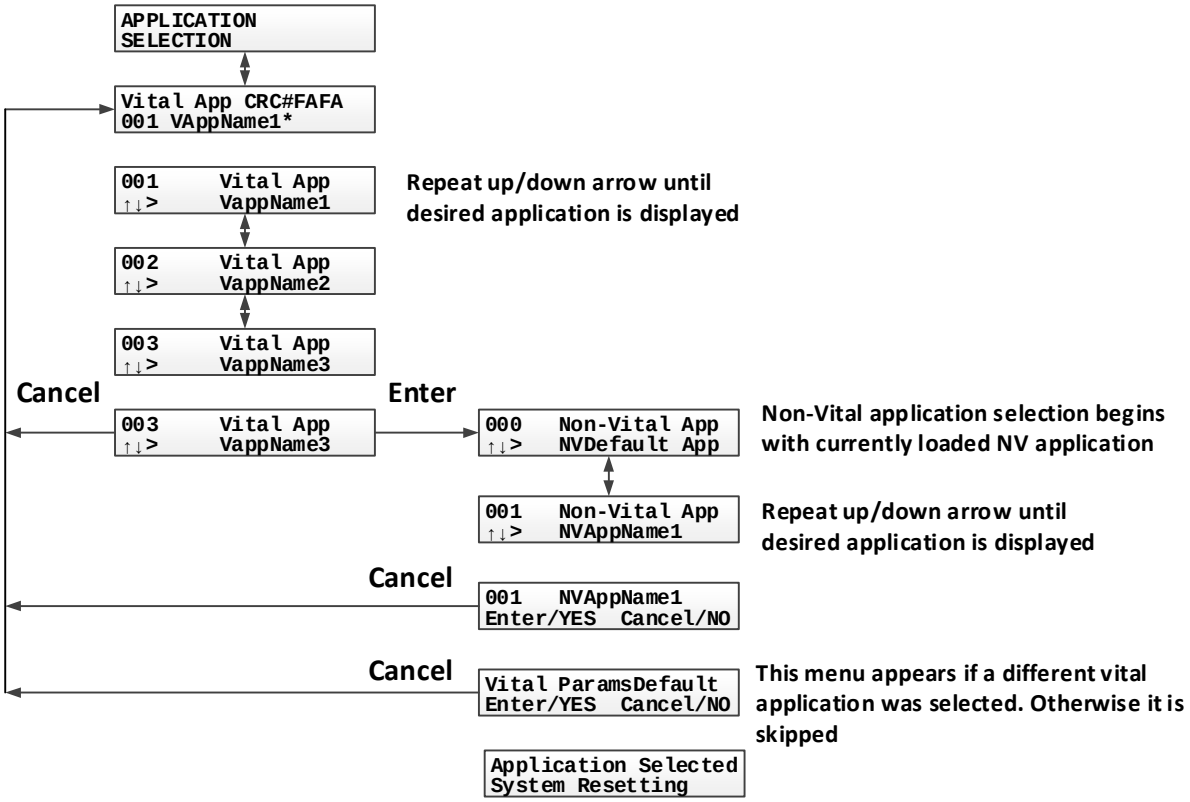


Figure X-X

Set Chassis ID Menu

Use the following menu shown in Figure X-X below to set the chassis ID.

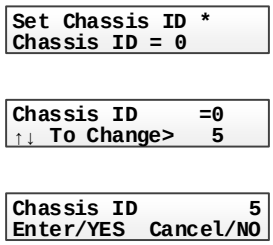


Figure X-X

Application Info Menu

Use the following menu shown in Figure X-X below to view the application information.

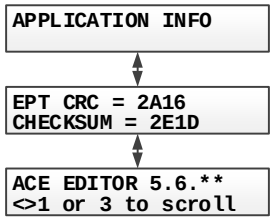


Figure X-X

PMD-4 Chassis ID/SSM Mismatch Menu

Use the following menu shown in Figure X-X below to view and modify the Chassis ID or SSM replaced information.

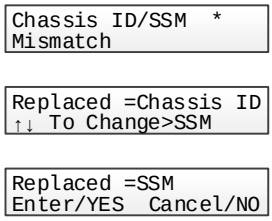


Figure X-X

Set Date and Time Menu

Use the following menu shown in Figure X-X below to set the date and time.

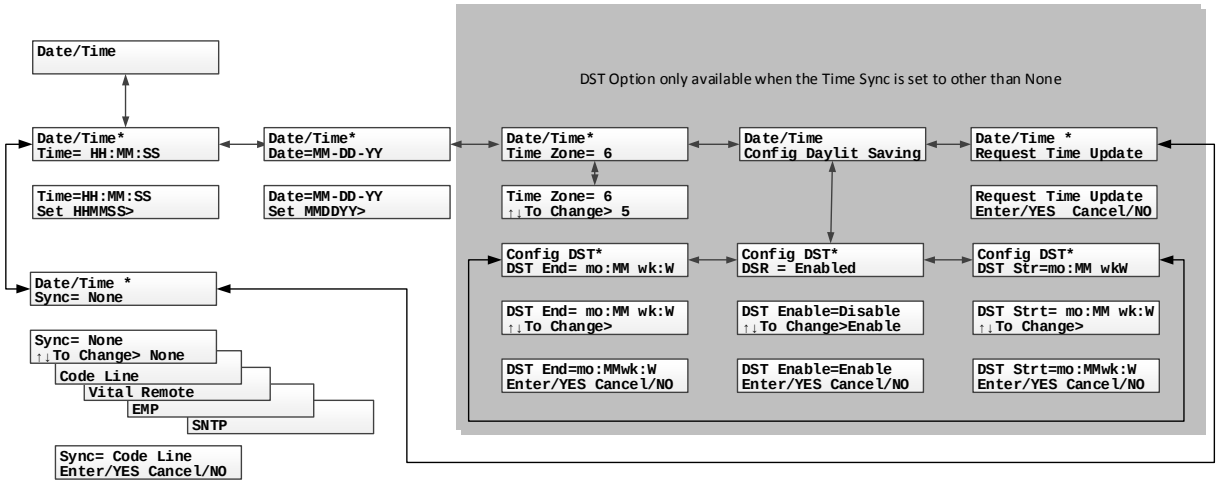


Figure X-X

Ethernet Configuration Menu

Use the following menu shown in Figure X-X below to configure the Ethernet ports.

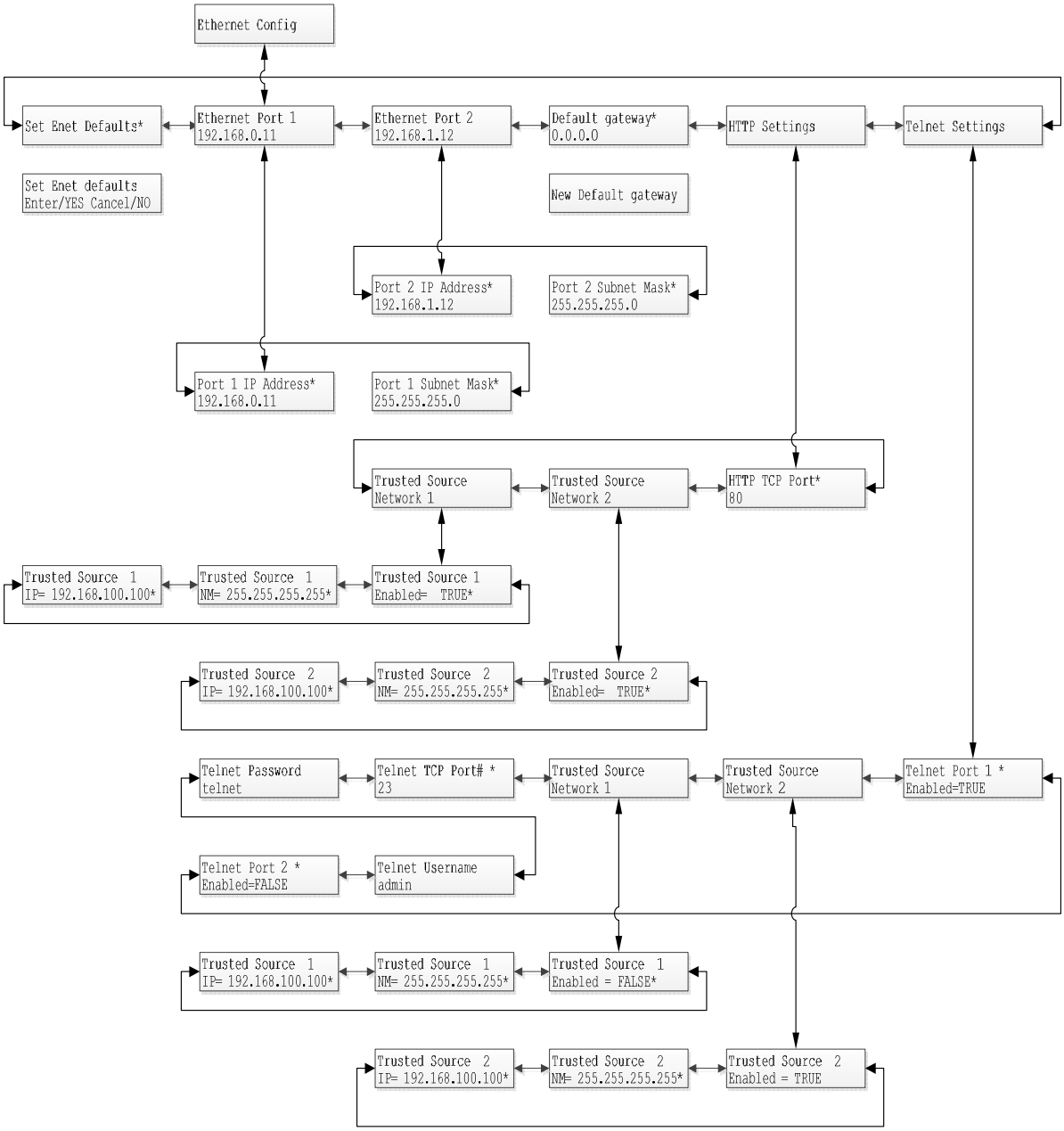

Ethernet Config
Set Enet Defaults*
Ethernet Port 1
192.168.0.11
Ethernet Port 2
192.168.1.12
Default gateway*
0.0.0.0
HTTP Settings
Telnet Settings
Set Enet defaults
Enter/YES Cancel/NO
New Default gateway
Port 2 IP Address*
192.168.1.12
Port 2 Subnet Mask*
255.255.255.0
Port 1 IP Address*
192.168.0.11
Port 1 Subnet Mask*
255.255.255.0
Trusted Source
Network 1
Trusted Source
Network 2
HTTP TCP Port*
80
Trusted Source 1
IP= 192.168.100.100*
Trusted Source 1
NM= 255.255.255.255*
Trusted Source 1
Enabled= TRUE*
Trusted Source 2
IP= 192.168.100.100*
Trusted Source 2
NM= 255.255.255.255*
Trusted Source 2
Enabled= TRUE*
Telnet Password
telnet
Telnet TCP Port# *
23
Trusted Source
Network 1
Trusted Source
Network 2
Telnet Port 1 *
Enabled=TRUE
Telnet Port 2 *
Enabled=FALSE
Telnet Username
admin
Trusted Source 1
IP= 192.168.100.100*
Trusted Source 1
NM= 255.255.255.255*
Trusted Source 1
Enabled = FALSE*
Trusted Source 2
IP= 192.168.100.100*
Trusted Source 2
NM= 255.255.255.255*
Trusted Source 2
Enabled = TRUE

Figure X-X

Vital Configuration Menu

Use the following menu shown in Figure X-X below to configure the Vital Configuration Switches.

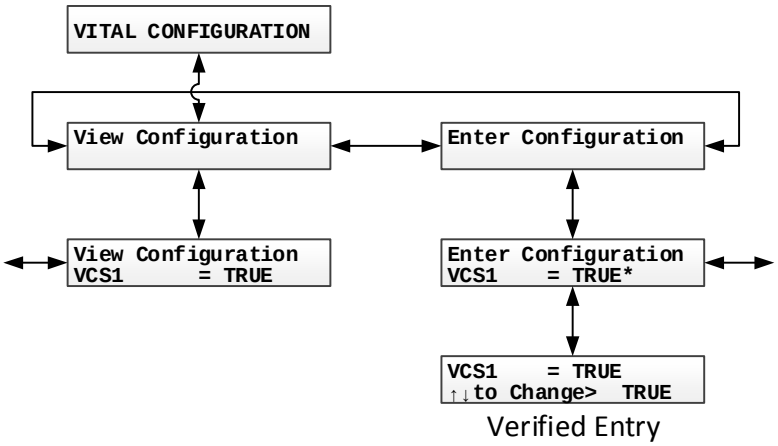


Figure X-X

Log Management Menu

Use the following menu shown in Figure X-X below to view and configure the logs.

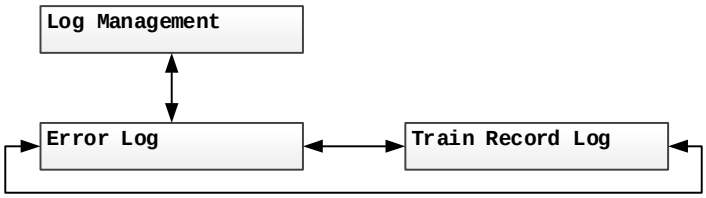


Figure X-X

Error Log

Use the following menu shown in Figure X-X below to view and clear the error log.

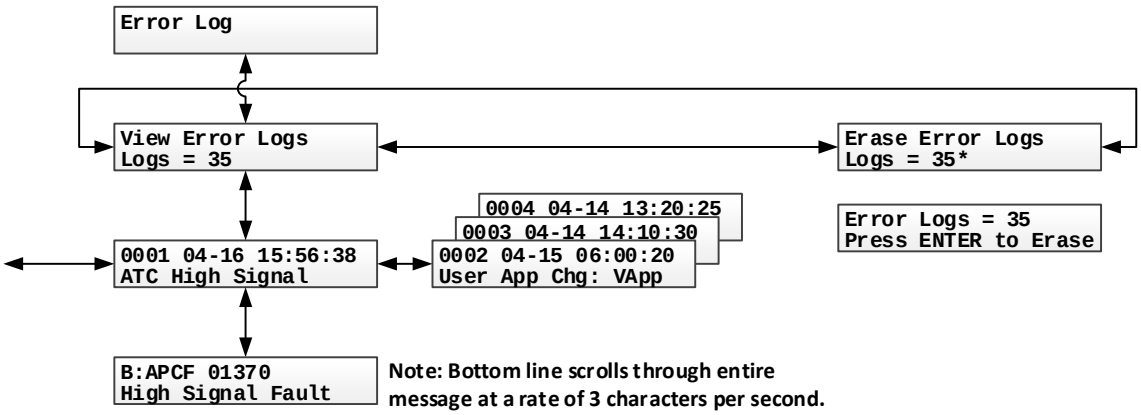


Figure X-X

Train Record Log

Use the following menu shown in Figure X-X below to view and clear the train record log.

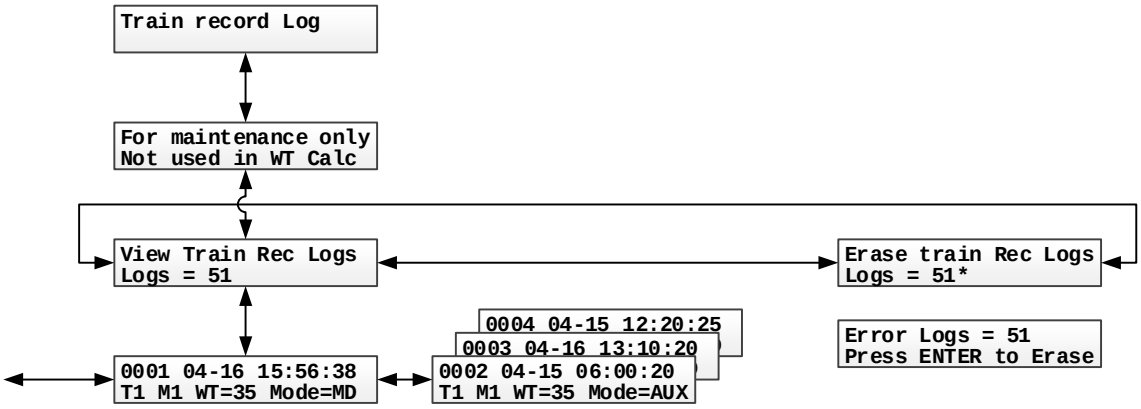


Figure X-X

Alarm Menu

Use the following menu shown in Figure X-X below to view and clear alarms.

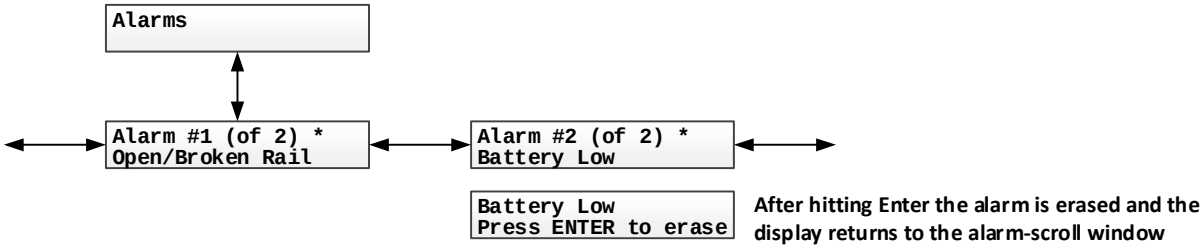

Alarms
Alarm #1 (of 2) *
Open/Broken Rail
Alarm #2 (of 2) *
Battery Low
Battery Low
Press ENTER to erase
After hitting Enter the alarm is erased and the display returns to the alarm-scroll window

Figure X-X

Executive Info Menu

Use the following menu shown in Figure X-X below to view the executive information.

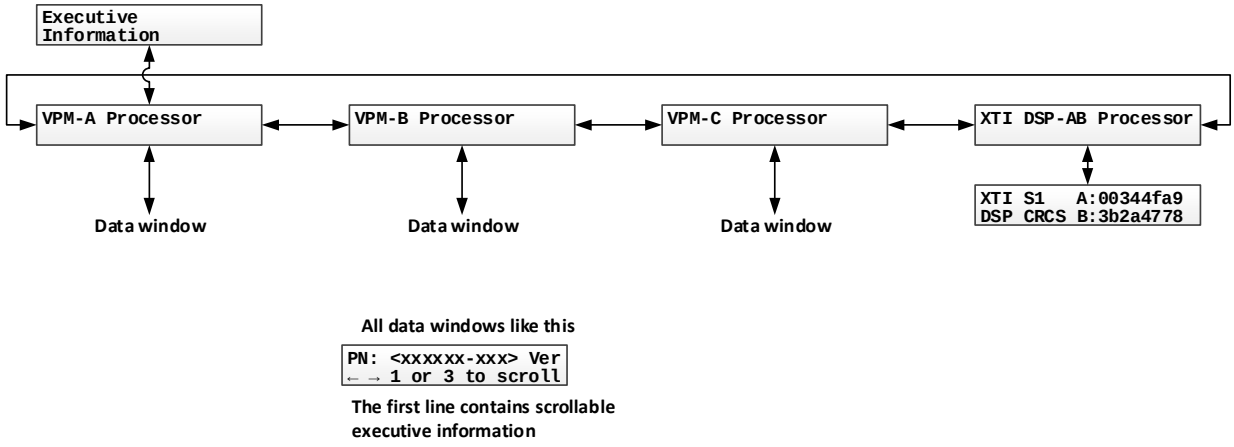


Figure X-X

Software Activation Menu

Use the following menu shown in Figure X-X below to apply an executive version that has previously been uploaded to the PMD-4 unit.

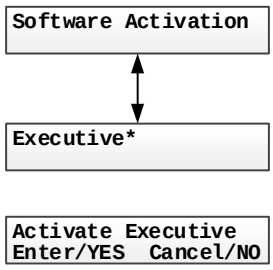


Figure X-X

Local User Confirmation

Use the following menu shown in Figure X-X below to confirm the local user.

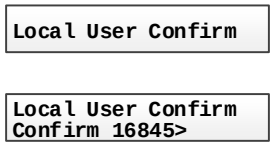


Figure X-X

Crossing Maintenance Menu

The following Figure X-X below shows the menu structure for Crossing Maintenance menu.

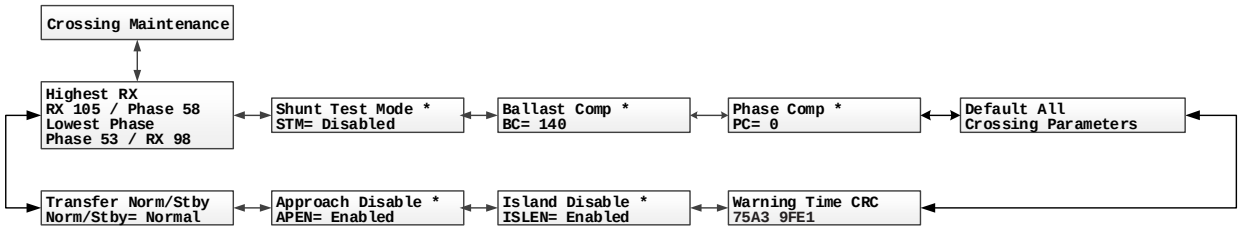


Figure X-X

Highest RX / Lowest Phase Menu

Use the following menu shown in Figure X-X below to view and clear the High/Low memory information.

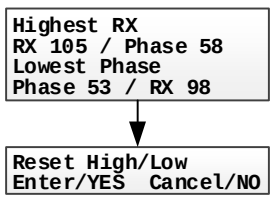


Figure X-X

Shunt Test Mode Menu

Use the following menu shown in Figure X-X below to enable or disable the shunt test mode.

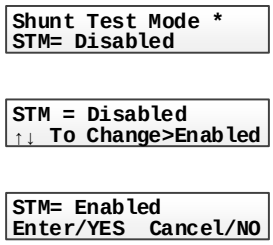


Figure X-X

Ballast Compensation Menu

Use the following menu shown in Figure X-X below to adjust the ballast compensation.

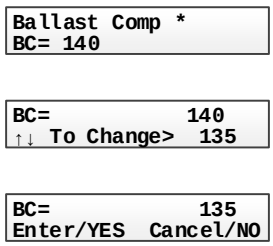


Figure X-X

Phase Compensation Menu

Use the following menu shown in Figure X-X below to adjust the phase compensation.

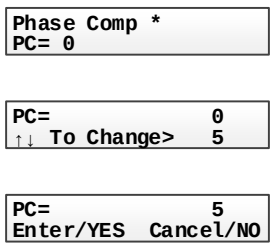


Figure X-X

Default All Crossing Parameters Menu

Use the following menu shown in Figure X-X below to set all setup options to the application default settings .

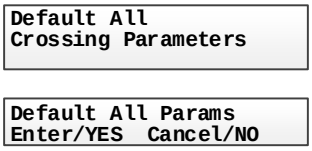


Figure X-X

Warning Time CRC Menu

Use the following menu shown in Figure X-X below to view the warning time CRC.

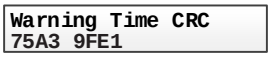
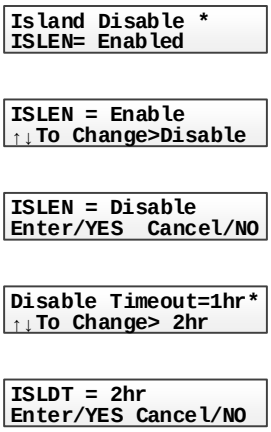


Figure X-X

Island Disable Menu

Use the following menu shown in Figure X-X below to enable and disable the island circuit. This menu is available only when the internal island is selected

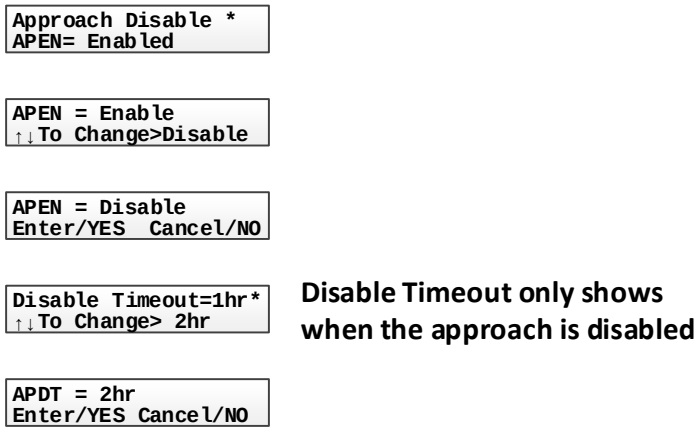


Disable Timeout only shows when the Island is disabled

Figure X-X

Approach Disable Menu

Use the following menu shown in Figure X-X below to enable and disable the approach circuit.



Disable Timeout only shows when the approach is disabled

Figure X-X

Normal Standby Operation Menu (PMD-4R Only)

Use the following menu shown in Figure X-X below to transfer the track from normal to standby operation and back. This menu option is only available with PMD-4R unit.

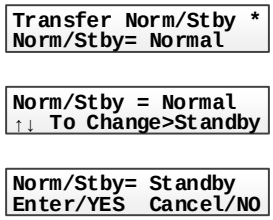


Figure X-X Normal/Standby Menu

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Chapter 7 – Web Graphical User Interface

WARNING *Unauthorized modification of PMD-4/4R parameters or configuration may result in unsafe conditions that could result in death or serious injury. Responsibility for security of passwords for equipment access lies with the railway authority. Passwords should be of a non-obvious nature and of sufficient length to preclude an unauthorized user from easily guessing the password. Reference SRAC2.*

Introduction

A PMD-4/4R system provides user access to status, diagnostic, and set-up information via the Web Graphical User Interface (Web GUI). Access to the Web GUI is achieved by connecting to the Ethernet port, accessing the PMD-4/4R via an Internet web browser, and providing the correct username / password combination. Diagnostic, status, and control of system settings are then available via the various web pages provided by the Web GUI.

The loaded application program controls the access to the Web GUI for each of the two Ethernet ports. The application may set a port to “disabled’ (no Web GUI access permitted), Read Only (no parameter changes permitted) or Read & Write access. If the port is disabled, an attempt to access that port with a web browser results in a “You are not authorized to access this device” message being displayed. If the port is set to Read Only, all parameter entries are “grayed-out” allowing the values to be viewed but not changed. Similarly, if a parameter is otherwise not able to be modified (e.g. Local Presence is required but not established) the parameter appears "grayed-out" allowing the value to be viewed but not modified.

The emphasis of this section is the operation and usage of the Web GUI interface. While this interface allows the various parameters and settings to be viewed or modified, the discussion of the parameters themselves contained in the CDU section is not repeated.

Refer to the GE Wayside Wireless Crossings Controller document (100323-008) for information regarding the operation and usage of the Web GUI Interface for Wireless Crossings.

Connecting to the Web GUI

Access to the Web GUI is achieved via entering the IP address of the port in the web browser address bar after either connecting directly to the PMD4/PMD-4R Ethernet port or to the network being used by the PMD-4/4R system. As noted on the login page, the browser must have JavaScript and cookies enabled for Web GUI access and operation.

Note*: Some web page status updates may not be visible in Internet Explorer if a Web Content Scanner or a Java SSV Add-on is ENABLED on the web browser. To disable Web Content Scanner in Internet Explorer, go to Tools>Manage Add-ons, and disable the Web Content Scanner and Java SSV Add-on.*

Supported Web GUI Operations

The Web based Graphical User Interface (WebGUI) is a primary means of configuring and troubleshooting the PMD-4/4R and is designed as a setup, configuration, and diagnostic aid. With the inherent flexibility provided by web based interface to a real time system comes the user responsibility to use the tool in a manner that has been fully validated. The following guidelines define operation that GE has validated and will maximize reliability and performance. Wherever possible the WebGUI should be used according to these guidelines. For any use not defined below, the user may wish to contact GE technical support for guidance.

Supported Browsers

Web Browser	Browser Version
Internet Explorer	8.0 or later
Firefox	10.0 or later

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User Interface Recommendations

For the command terminal interfaces(Telnet, SSH) the recommended practice is to use only one of these interfaces at a time.

For the Web GUI, the recommended practice is to have three or fewer concurrent browser tabs open / active for a single device or only one browser tab/window active if concurrently using the Web GUI and one of the command terminal interfaces.

For file transfers to / from the unit on any user interface, the recommended practice is to suspend activity on all other user interfaces, including closing any other open browser tabs, until the file transfer has completed.

When applying Configuration, Application or Executive files, the recommended practice is to suspend activity on all other user interfaces, including closing any other open browser tabs, until the file has been applied.

For the WebGUI, the recommended practice is to have only a single browser tab/window showing a Status page and only a single browser tab/window showing the Live Log page.

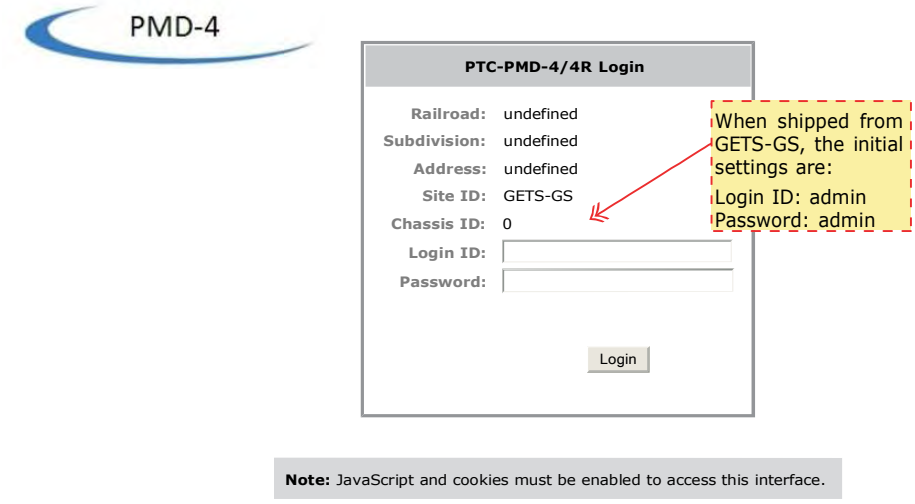

Figure 7-1, Web GUI Login

Web GUI Login

The Login page displays identifying information for the specific PMD-4/4R system along with entry boxes for Login ID and Password.

PMD-4/4R allows a single user to be logged in at a time. If there is an active session when another user enters login information, the user logging in is informed that another user is already logged on and is asked to either continue or cancel the login process. Selecting “continue” logs the other user out and logs the second user in. Selecting cancel returns the user to the log in page. *See Figure 7-2*.

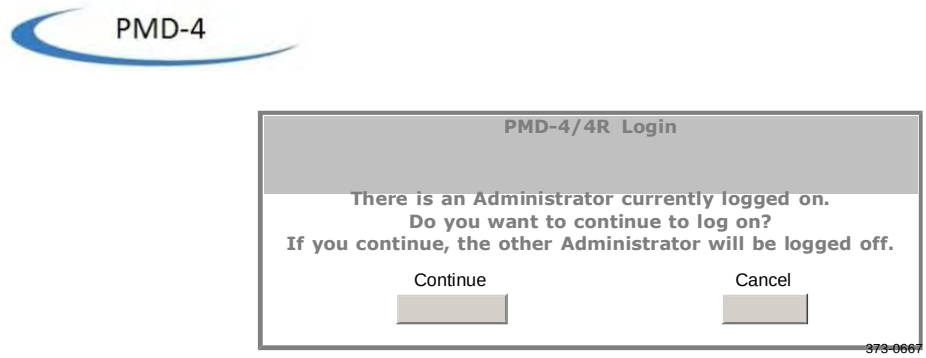

Figure 7-2, Web GUI Login, Other User Session Active

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Web GUI Navigation

The Web GUI pages are divided among four Main Menu categories: General, Configuration, Diagnostics, and Status with the names of these Main Menu categories appearing across the top of each page. Selecting one of the Main Menu categories displays the Side Menu for that category. Selecting an item on the Side Menu displays the web page for that item in the main portion of the screen. *See Figure 7-3* for an example web page that depicts these various areas in the computer format of the page.

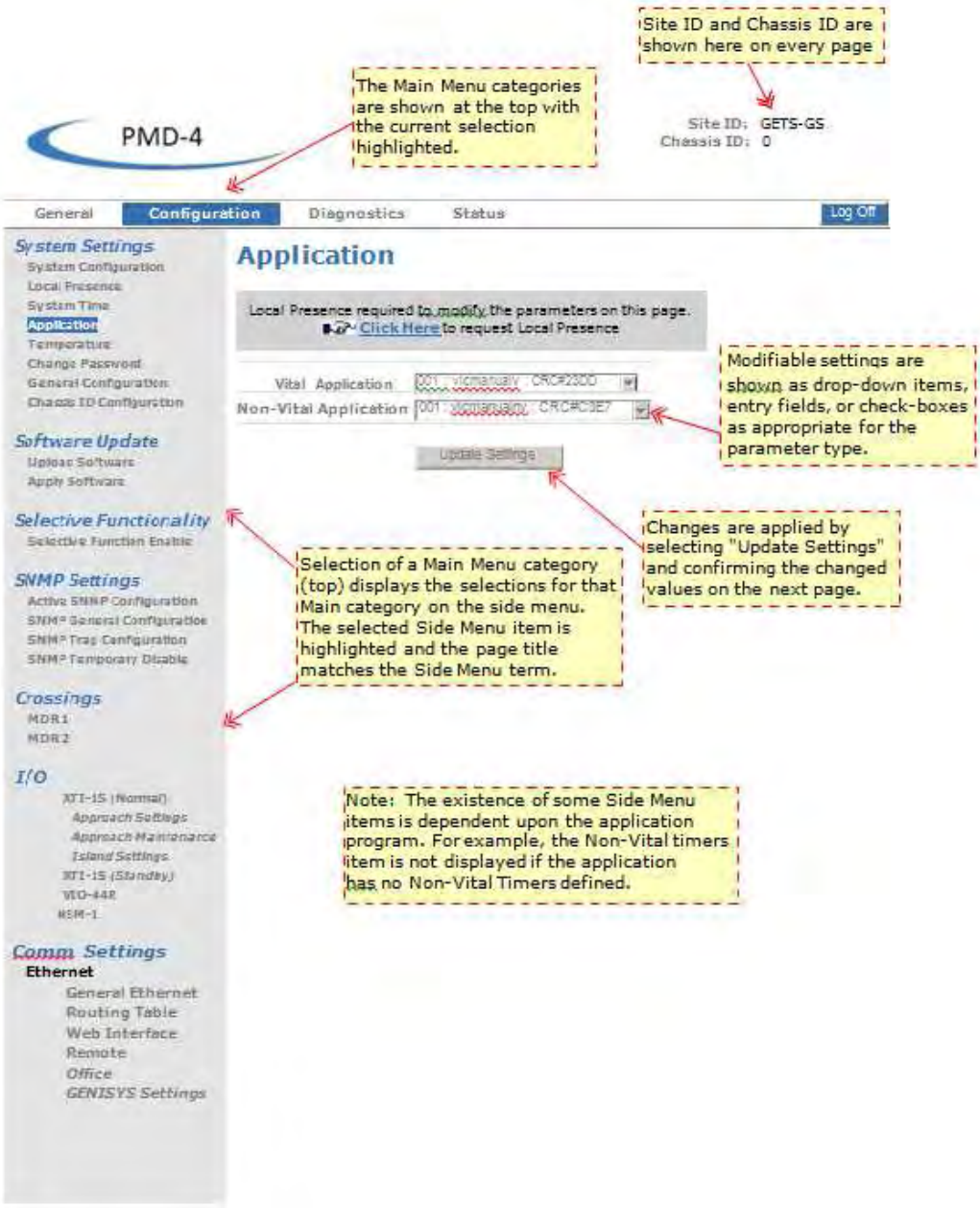
Site ID and Chassis ID are shown here on every page
The Main Menu categories are shown at the top with the current selection highlighted.
PMD-4
Site ID: GETS-GS
Chassis ID: 0
General
Configuration
Diagnostics
Status
Log Off
System Settings
System Configuration
Local Presence
System Time
Application
Temperature
Change Password
General Configuration
Chassis ID Configuration
Software Update
Upload Software
Apply Software
Selective Functionality
Selective Function Enable
SNMP Settings
Active SNMP Configuration
SNMP General Configuration
SNMP Trap Configuration
SNMP Temporary Disable
Crossings
MDR1
MDR2
I/O
XT-1S (Normal)
Approach Settings
Approach Maintenance
Island Settings
XT-1S (Standby)
VIO-4AR
RSM-1
Comm Settings
Ethernet
General Ethernet
Routing Table
Web Interface
Remote
Office
GENISYS Settings
Application
Local Presence required to modify the parameters on this page.
Click Here to request Local Presence
Vital Application
Non-Vital Application
Update Settings
Modifiable settings are shown as drop-down items, entry fields, or check-boxes as appropriate for the parameter type.
Changes are applied by selecting "Update Settings" and confirming the changed values on the next page.
Selection of a Main Menu category (top) displays the selections for that Main category on the side menu. The selected Side Menu item is highlighted and the page title matches the Side Menu term.
Note: The existence of some Side Menu items is dependent upon the application program. For example, the Non-Vital timers item is not displayed if the application has no Non-Vital Timers defined.

Figure 7-3, Web GUI Main Menu

As a convenience, some pages (e.g. the I/O module pages) have a pair of links on the page that allows navigation to the Configuration, Diagnostics, or Status pages for that item. This feature allows all aspects of an I/O module to be “one-click away” from the current page. *See Figure 7-4*.

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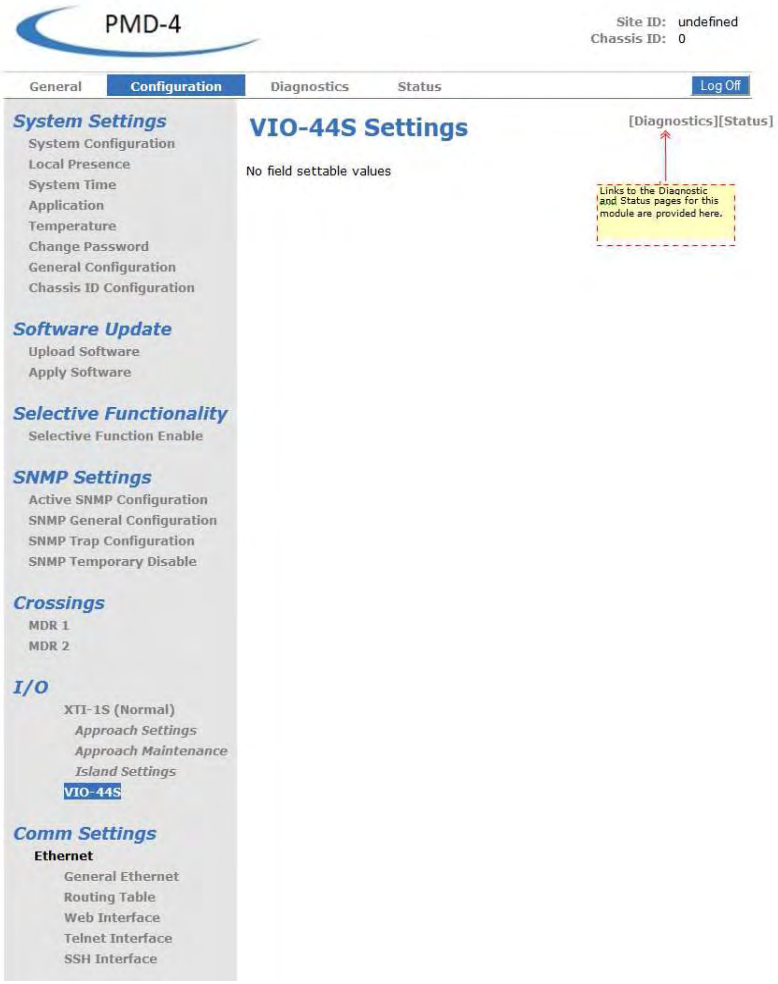

Figure 7-4, Web GUI Configuration Menu

Main Menu Categories

The following paragraphs describe the overall purpose and type of information available under each of the four Main Menu categories. A more detailed description of the pages themselves follows in a later section.

General

Items under the General menu depict the top-level condition of the system along with the information associated with the software and application program versions. No entries can be made on the pages under the General category.

Configuration

The Configuration pages allow viewing and modification of the various programmable settings for the PMD-4/4R system as well as the individual modules that have settable parameters. The one page that is the exception to this is the System Configuration page, which lists the current values of all the settable parameters. This one page can be printed or saved electronically from the web browser to capture the current values of the system settings.

Diagnostics

The Diagnostic pages provide for viewing and download of the various PMD-4/4R logs as well as provide access to the diagnostic modes of the PMD-4/4R I/O modules.

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Status

The Status pages allow viewing of the current value of the various application statuses in the loaded application program. This page automatically refreshes the display of the status values every two seconds. The "All Statuses" Side Menu selection lists every status in the application in alphanumeric order of the status names. Selecting an I/O Module or Communication Port shows only those statuses associated with that module or that communications channel. Selecting the "Watch" box next to a status name places it under the Watch Statuses Side Menu so that any group of statuses may be selected for more convenient monitoring. *Figure 7-5* depicts these items on the All Statuses page.

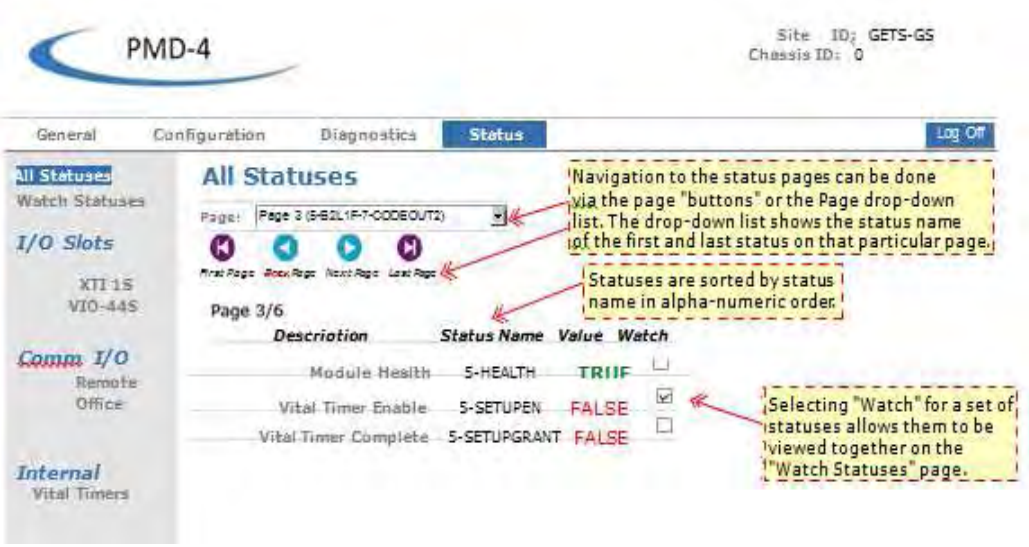

Figure 7-5, Web GUI Status Menu

Parameter Update

Modification of PMD-4/4R parameters via the Web GUI is a two-step process for any type of parameter. After changing one or more parameters on a given web page, select "Update Settings" below the list of parameters (*See Figure 7-6*). This selection causes the parameter confirmation page to be displayed for the parameters listed on that specific page. All modifiable parameters on the entry page are shown on the confirmation page with those parameters that have modified values highlighted (*See Figure 7- 7*). Selecting "Confirm" causes the new parameter values to be accepted. Selecting "Cancel" causes the new values to be rejected. In both cases, the user is returned to the web page being viewed previously. If a parameter change is not confirmed within 60 seconds of selecting "Update Settings", the modifications are canceled by the system and the previous page is displayed.

If an out-of-range entry is submitted or an error occurs during the update process, the Web GUI indicates the type of error. When an error occurs, the requested update is canceled and must be reentered.

Some parameter updates may alter the operation of the system or the ability to access the system via the Web GUI in a non-obvious way. When such is the case, an Alert is provided on the confirmation screen to indicate the resulting behavior. *Figure 7-8* shows an example of an alert message. In this example case, the current user will be logged out if the change is accepted.

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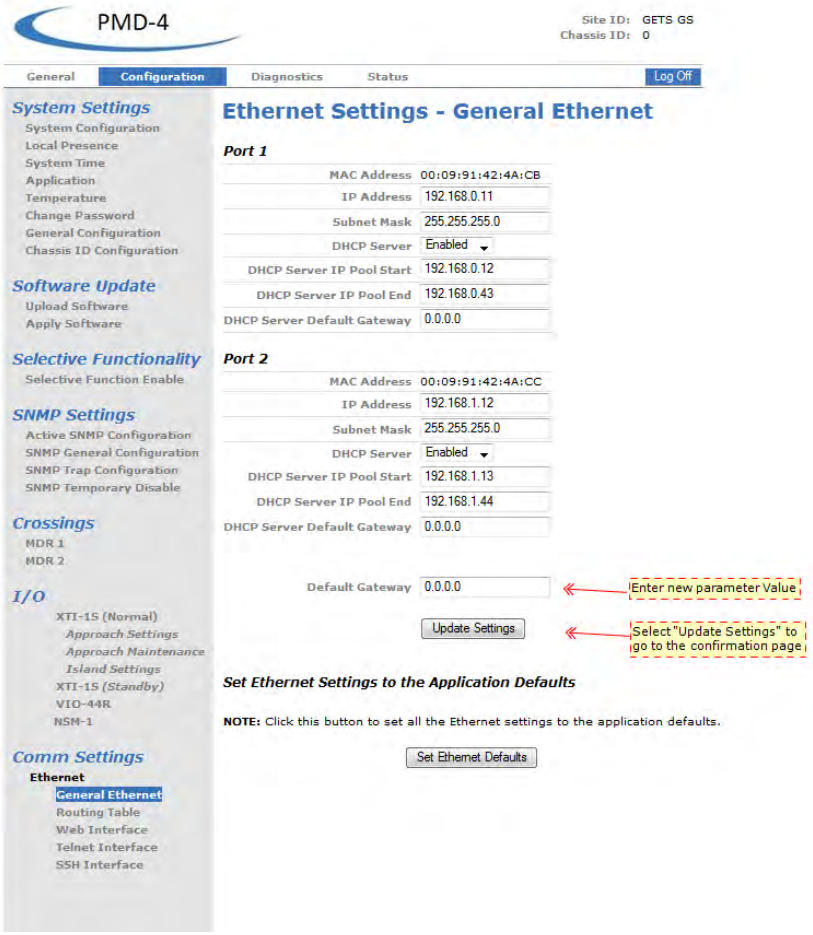

Figure 7-6, Configuration - General Ethernet Example

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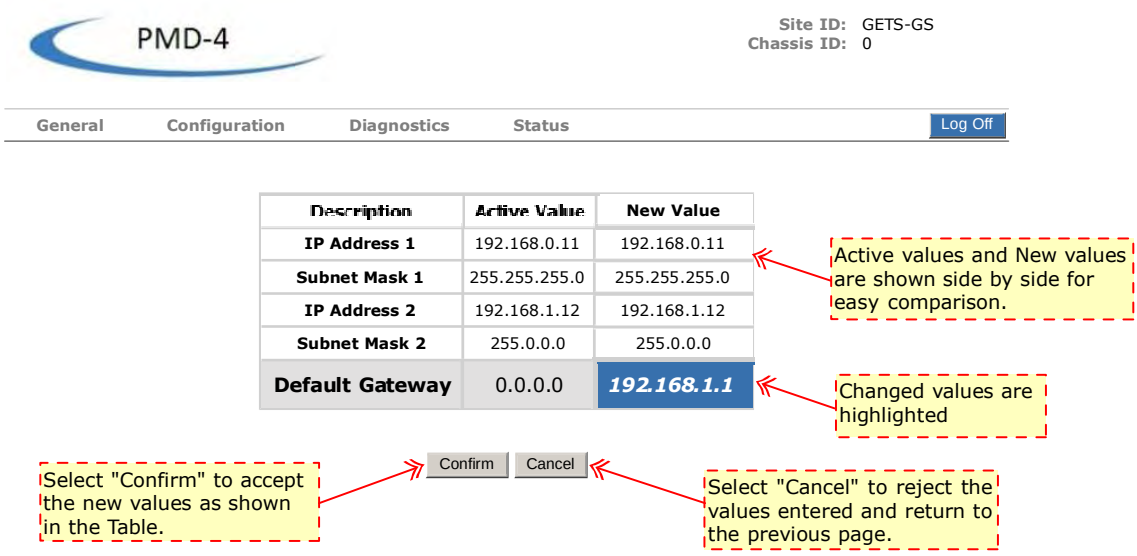

Figure 7-7, Submit Form Example

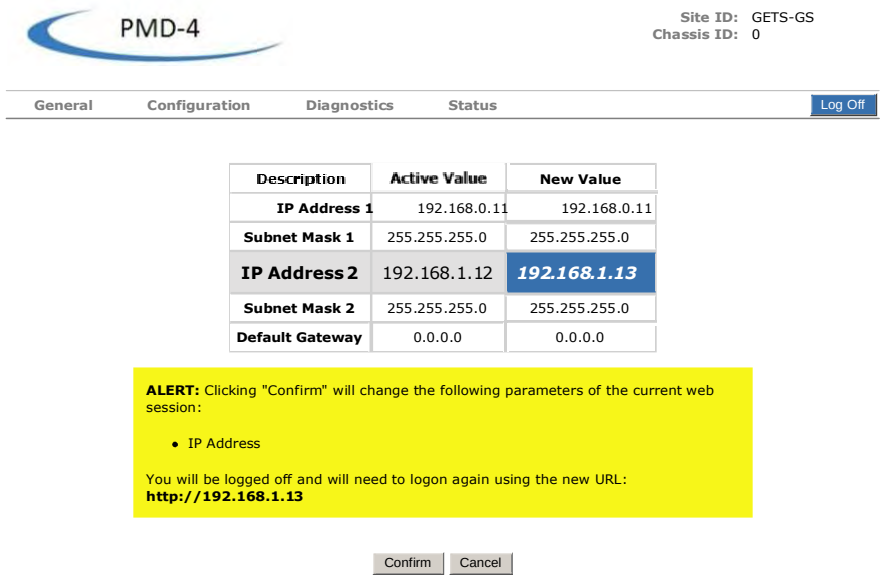

Figure 7-8, Web GUI Alert message

The application program has an access control setting that allows one or both of the Ethernet ports to be set to "Read Only." When that is the case, all parameters will be shown "Grayed-Out" and are not modifiable via that Ethernet Port.

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Parameter Update via Calibration

Certain parameters are updated when the PMD-4/4R performs a calibration followed by user confirmation of the calculated values. When calibration is commanded via the Web GUI, a page, similar to Figure 7-9, is displayed. This page shows the progress of the calibration and indicates “In Progress” while the calibration steps are being performed. When the calibration completes successfully, the status value so indicates and the user may accept / confirm the new values by selecting the “Update Settings” button and confirming the new values.

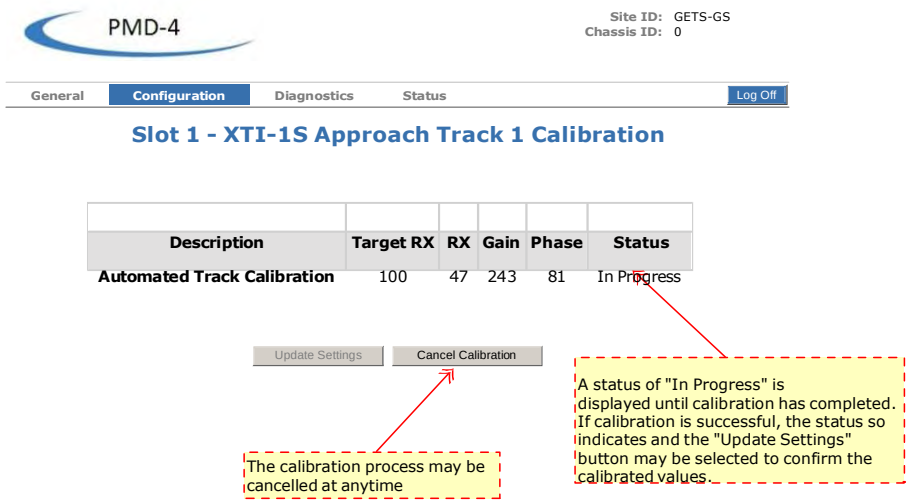

Figure 7-9, Calibration Example

Parameter Evaluation

Certain XTI-1S parameters may have values “evaluated” prior to their being updated and confirmed for operation. Parameters that may have values evaluated are denoted by an “Evaluate” button to the right of the parameter value.

To see the effects of a parameter value change, enter the proposed value and select “Evaluate.” The Web-GUI will display the “Previous” value (the current setting) and the “Evaluate” value below the refreshed crossing parameters. The previous value and the evaluated value are highlighted as shown in Figure 7-10.

The temporary value will remain in effect until 1) 60 seconds have elapsed or 2) the “Previous” value is entered and the “Evaluate” button is selected for the parameter. Additional values may be evaluated at any time. To make the evaluated value the new setting value, select the “Update Settings” button and confirm the new value.

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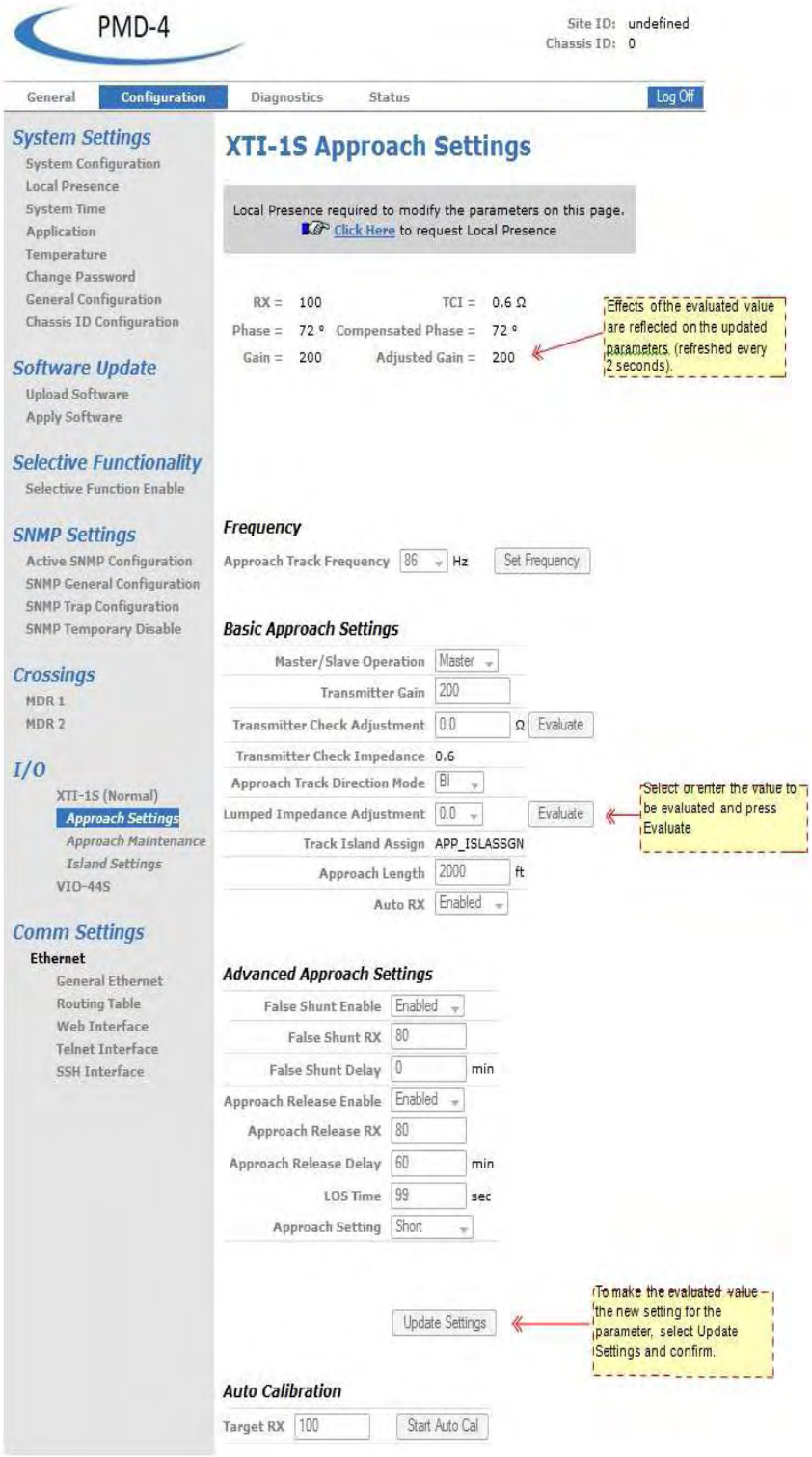

Figure 7-10, Parameter Evaluation

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Local Presence

Modification of vital parameters via the Web GUI requires Local Presence to be established for the active Web GUI session. Each web page that requires Local Presence for parameter entry has a link to the Local Presence page. When this web page link is used to navigate to the Local Presence page, the user returns to the original page after Local Presence is established. A link to Local Presence is also provided on the Configuration page Side Menu under System Settings.

To establish Local Presence, navigate to the Local Presence page. Select "Request Local Presence" (*See Figure 7-11*) and follow the instructions on the Local Presence Confirmation screen (*See Figure 7-11*). When the Local Presence Key is typed in correctly, the three digit Local User Confirmation keys on the CDU have been pressed, and the "Confirm Request for Local Presence" is selected within 60 seconds of the initial request, Local Presence is established for the current login session.

Note that if the three digit Local User Confirmation Keys on the CDU is pressed out of sequence, pressed more than once, or pressed longer than five seconds Local Presence will not be established.

Local Presence remains in effect until one of the following occur:

1. Local Presence is disabled via the Web GUI (Local Presence page).
2. The active session ends (user logs out or is logged out)
3. Local Presence is established via the CDU
4. Thirty minutes elapses since the last parameter change (any parameter)
5. The PMD-4/4R is reset.

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The Local Presence page indicates the current state of Local Presence (Established or Not Established) along with a button to change the state.

Figure 7-11, Local Presence

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After requesting Local Presence, the Local Presence key value displayed on the next web page must be entered. The key is always letter-number-letter-number-letter. Press the three digit numeric Local User Confirmation keys on the CDU followed by the Enter key prior to selecting “Confirm” on the WebGUI. If all steps are followed in sequence, Local Presence is established for the current login session.

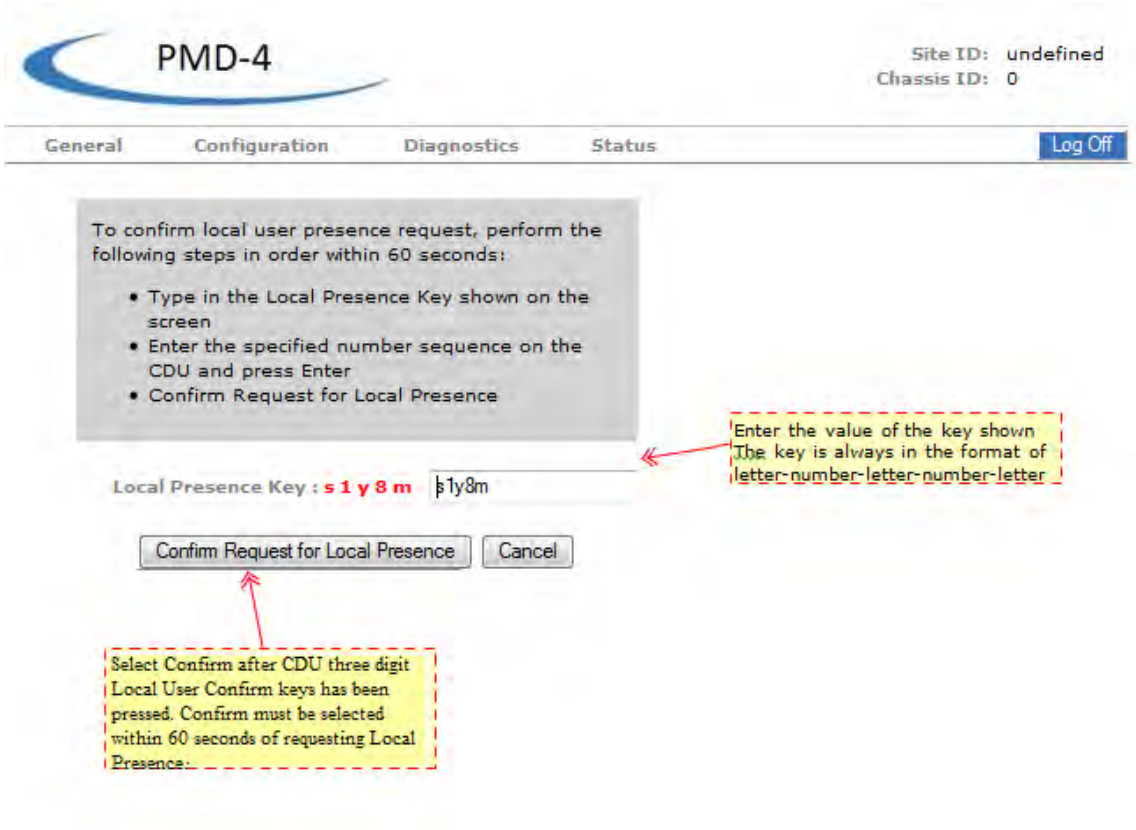
PMD-4
Site ID: undefined
Chassis ID: 0
General
Configuration
Diagnostics
Status
Log Off
To confirm local user presence request, perform the following steps in order within 60 seconds:
• Type in the Local Presence Key shown on the screen
• Enter the specified number sequence on the CDU and press Enter
• Confirm Request for Local Presence
Enter the value of the key shown The key is always in the format of letter-number-letter-number-letter
Local Presence Key : s 1 y 8 m
s1y8m
Confirm Request for Local Presence
Cancel
Select Confirm after CDU three digit Local User Confirm keys has been pressed. Confirm must be selected within 60 seconds of requesting Local Presence.

Figure 7-12, Confirm Local Presence

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Web GUI Pages

General Main Menu

The pages in this section are on the Side Menu under the General main menu category.

General Information

The General Information page displays identifying information from the selected application, and PMD-4/4R system along with the list of active alarms and the status of each module defined in the application. Links to the Alarms page and the Configuration, Diagnostic, and Status pages of each of the I/O modules and communication interfaces are provided.

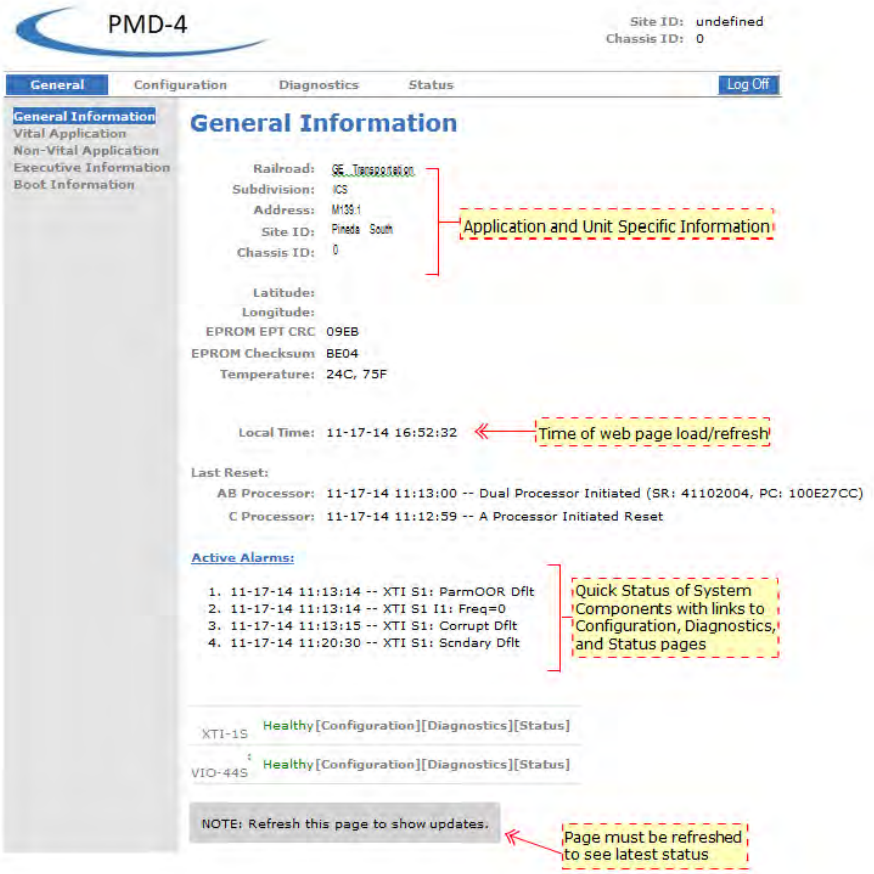

Figure 7-13, General - General Information

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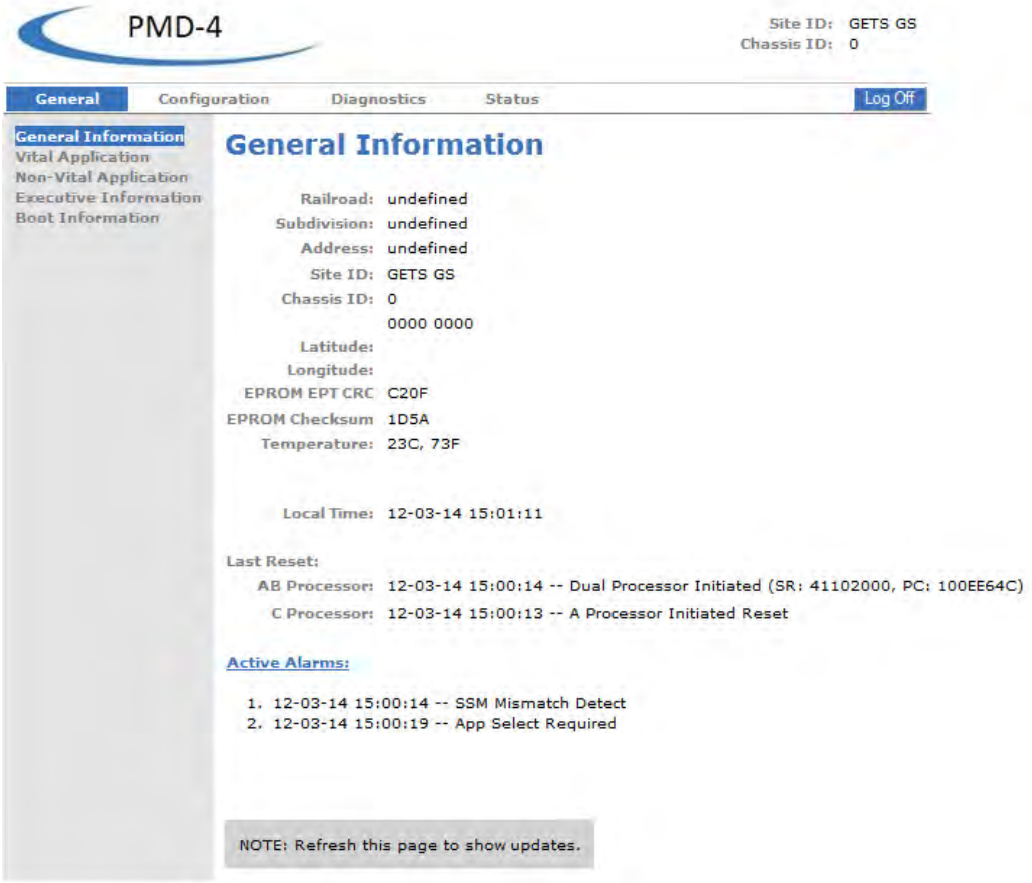

Figure 7-13a, General - General Information(SSM Mismatch Detected)

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Vital Application and Non-Vital Application

Two pages are provided to display the information for each of the selected applications.

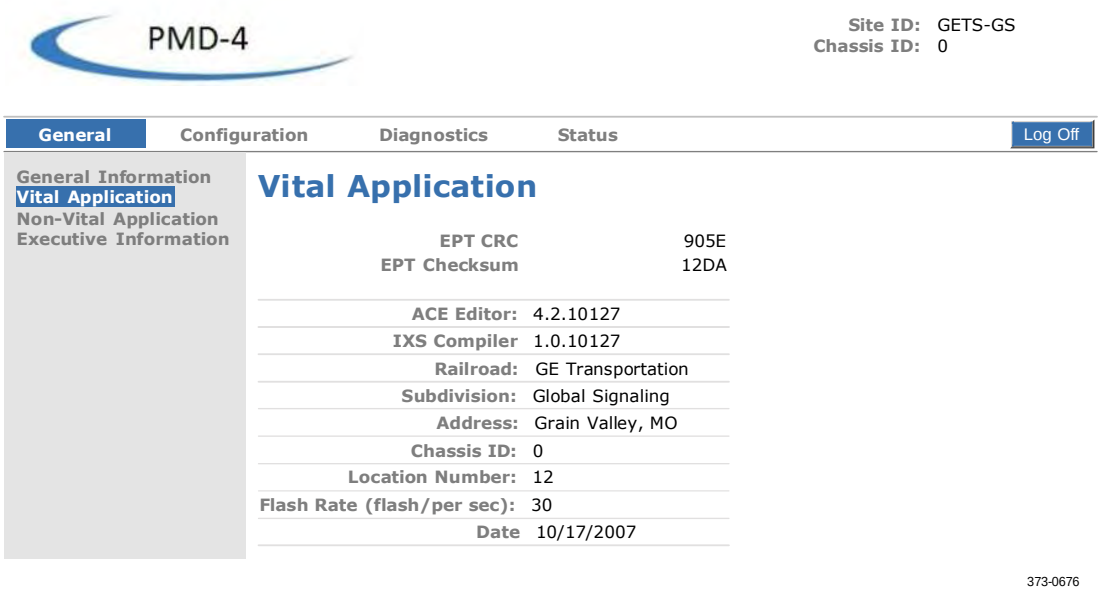

Figure 7-14, General - Vital Application

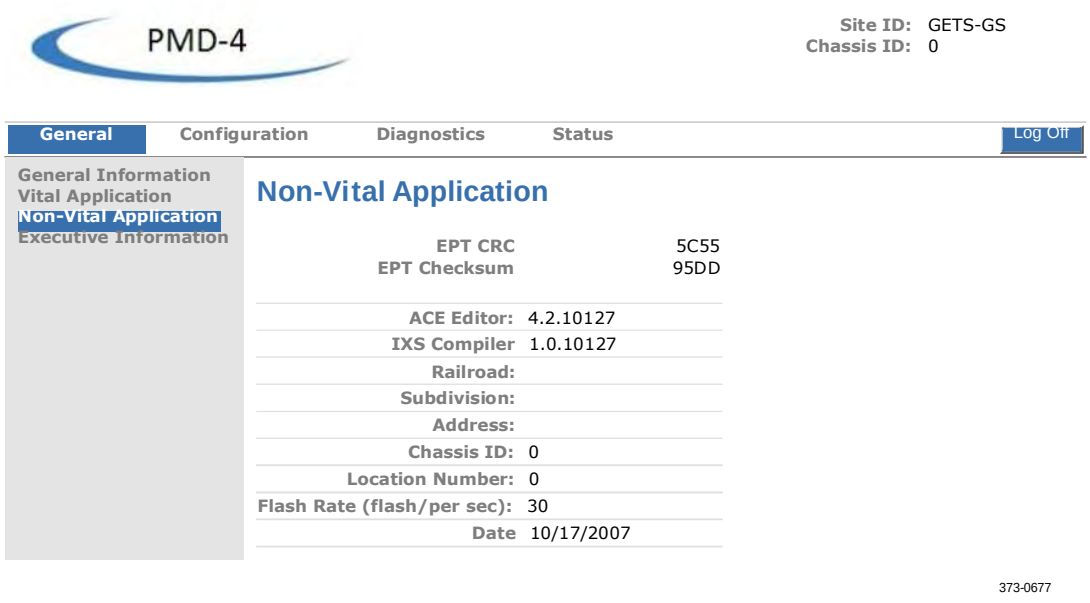

Figure 7-15, General - Non-Vital Application

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Executive Information

The Executive Information page displays the available information for all processors in the unit. The amount and type of information available is dependent upon the module type.

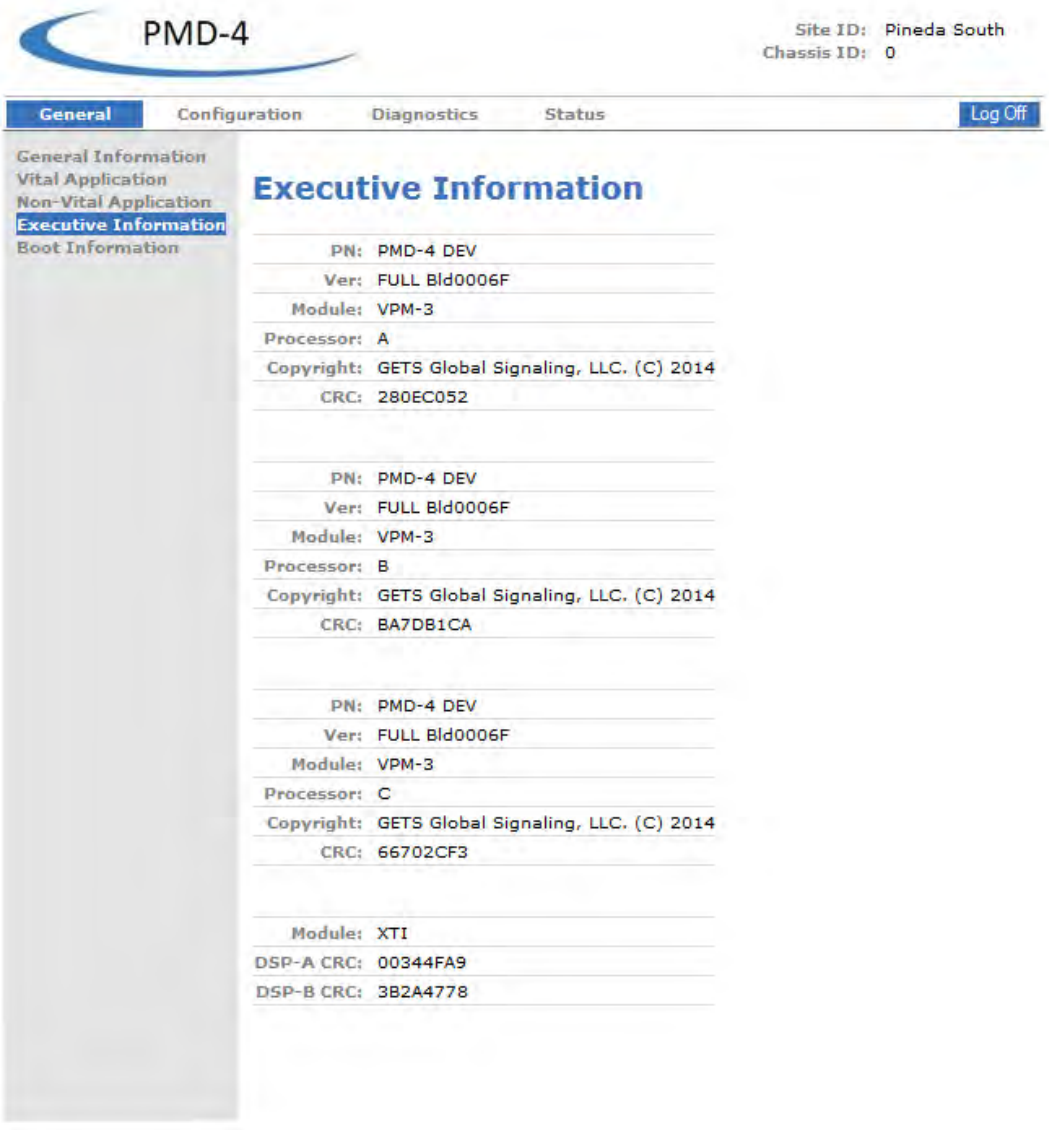

Figure 7-16, General - Executive Information

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Configuration Main Menu – System Settings

System Configuration

The System Configuration page displays the current value for the various configuration settings in the PMD-4/4R system. This page may be printed or saved electronically from the web browser to capture the current value of all system settings.

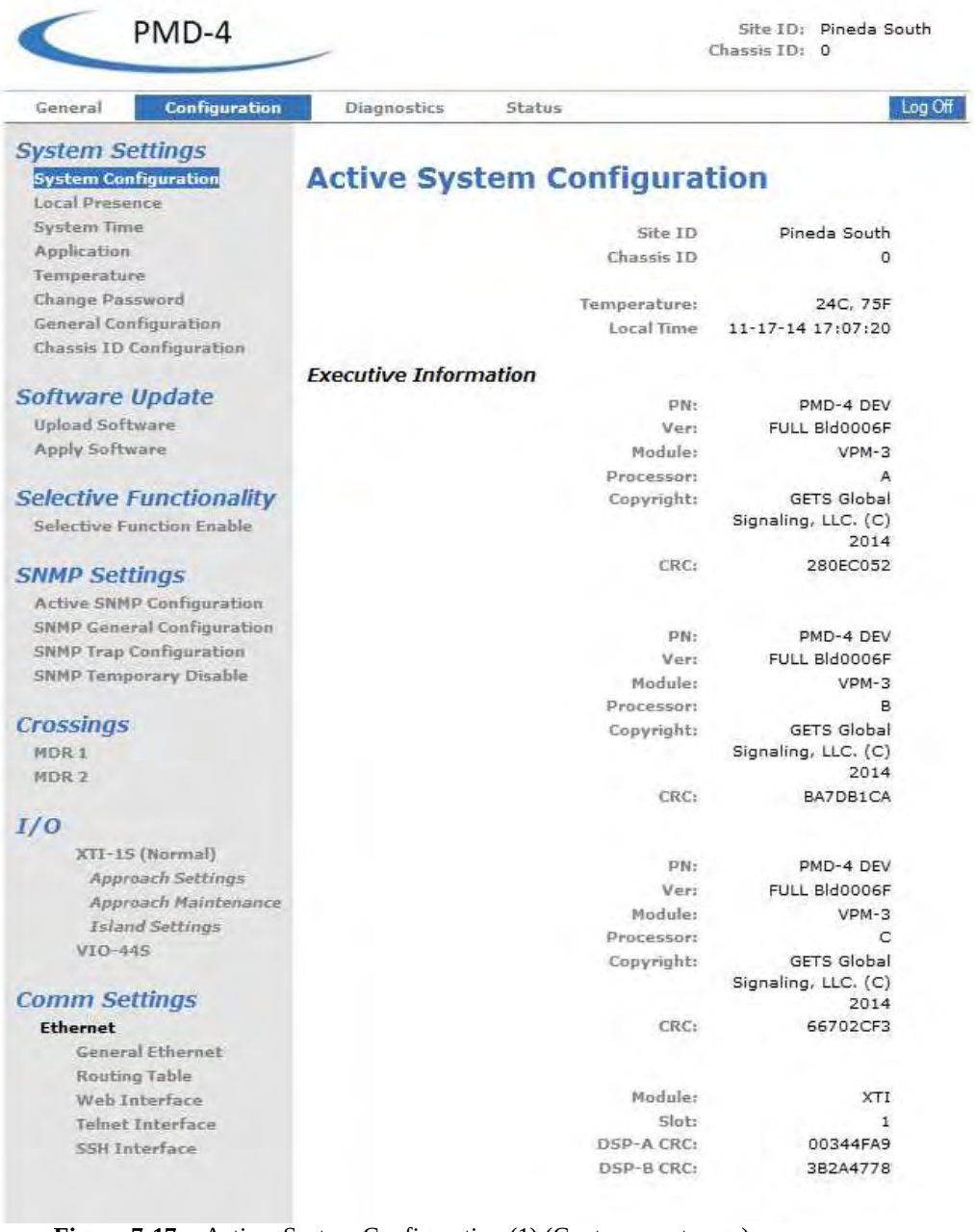

Figure 7-17 - Active System Configuration (1) (Cont. on next page)

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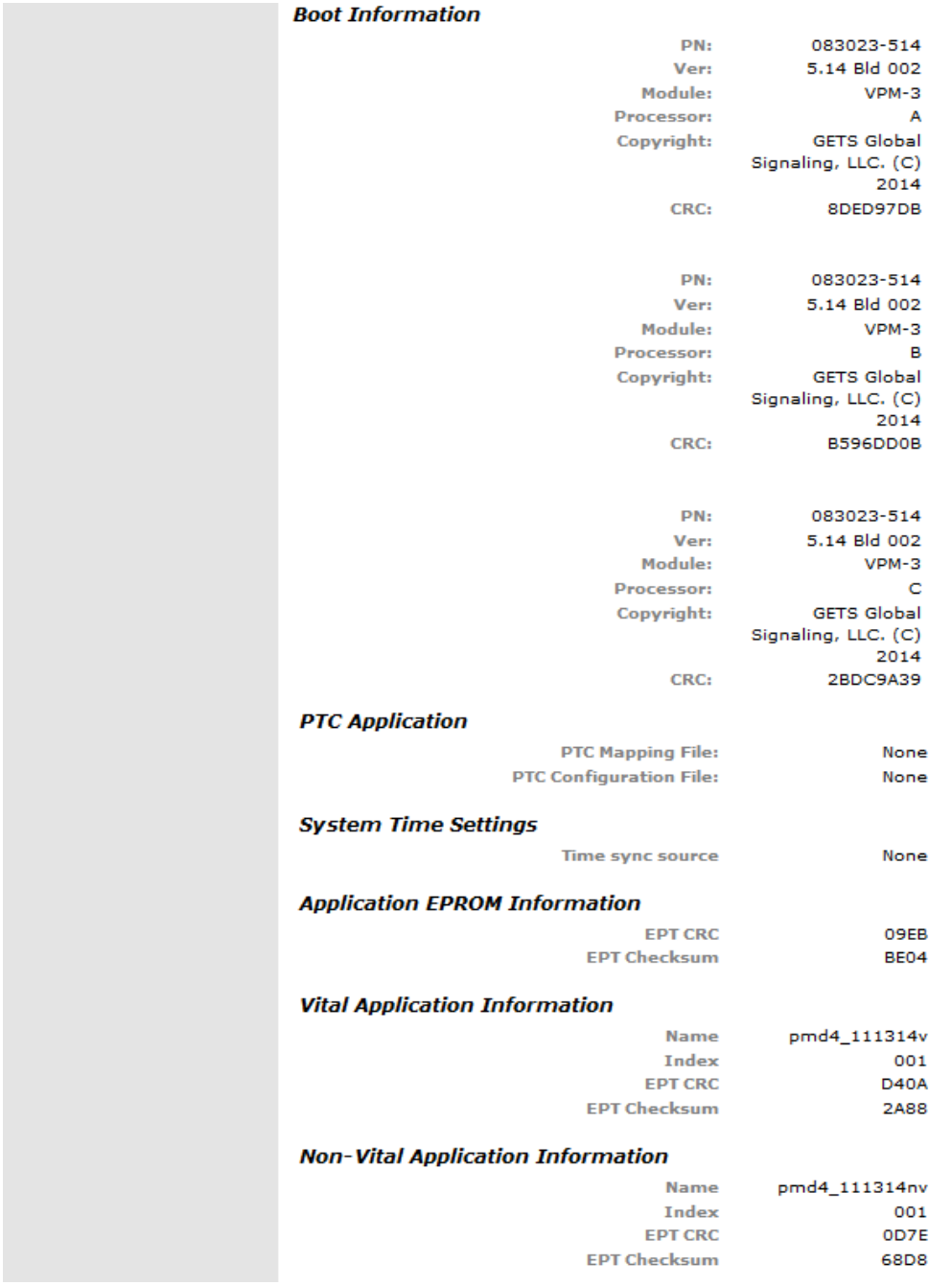

Boot Information

PN:	083023-514
Ver:	5.14 Bld 002
Module:	VPM-3
Processor:	A
Copyright:	GETS Global Signaling, LLC. (C) 2014
CRC:	8DED97DB

PN:	083023-514
Ver:	5.14 Bld 002
Module:	VPM-3
Processor:	B
Copyright:	GETS Global Signaling, LLC. (C) 2014
CRC:	B596DD0B

PN:	083023-514
Ver:	5.14 Bld 002
Module:	VPM-3
Processor:	C
Copyright:	GETS Global Signaling, LLC. (C) 2014
CRC:	2BDC9A39

PTC Application

PTC Mapping File:	None
PTC Configuration File:	None

System Time Settings

Time sync source	None

Application EPROM Information

EPT CRC	09EB
EPT Checksum	BE04

Vital Application Information

Name	pmd4_111314v
Index	001
EPT CRC	D40A
EPT Checksum	2A88

Non-Vital Application Information

Name	pmd4_111314nv
Index	001
EPT CRC	0D7E
EPT Checksum	68D8

Figure 7-18 - Active System Configuration (2) (Cont. on next page)

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Crossing Warning Time Information

WT CRC	0C8C 919B

Ethernet Settings

IP Address 1	192.168.0.11
Subnet Mask 1	255.255.255.0
MAC Address 1	00:09:91:42:4A:CB
IP Address 2	192.168.1.12
Subnet Mask 2	255.255.255.0
MAC Address 2	00:09:91:42:4A:CC
Default Gateway	0.0.0.0
DHCP Server Port 1	Enabled
DHCP 1 Pool Start	192.168.0.12
DHCP 1 Pool End	192.168.0.43
DHCP 1 Default Gateway	0.0.0.0
DHCP Server Port 2	Enabled
DHCP 2 Pool Start	192.168.1.13
DHCP 2 Pool End	192.168.1.44
DHCP 2 Default Gateway	0.0.0.0

Routing Table Settings

No Entries

HTTP Settings

Inactivity timeout	60
HTTP TCP Port#	80
Trusted Source 1 Status	Disabled
Trusted Source 1 IP Addr	0.0.0.0
Trusted Source 1 Net Mask	0.0.0.0
Trusted Source 2 Status	Disabled
Trusted Source 2 IP Addr	0.0.0.0
Trusted Source 2 Net Mask	0.0.0.0

Telnet Settings

Telnet Port 1	Disabled
Telnet Port 2	Disabled
Telnet TCP Port#	23
Inactivity timeout	Disabled
Trusted Source 1 Status	Disabled
Trusted Source 1 Network	0.0.0.0
Trusted Source 1 Net Mask	0.0.0.0
Trusted Source 2 Status	Disabled
Trusted Source 2 Network	0.0.0.0
Trusted Source 2 Net Mask	0.0.0.0

SSH Settings

SSH Port 1	Enabled
SSH Port 2	Enabled
SSH Server Port#	22
SSH Inactivity timeout	Disabled
Authorized Keys File CRC	0x00000000

Figure 7-19 - Active System Configuration (3) (Cont. on next page)

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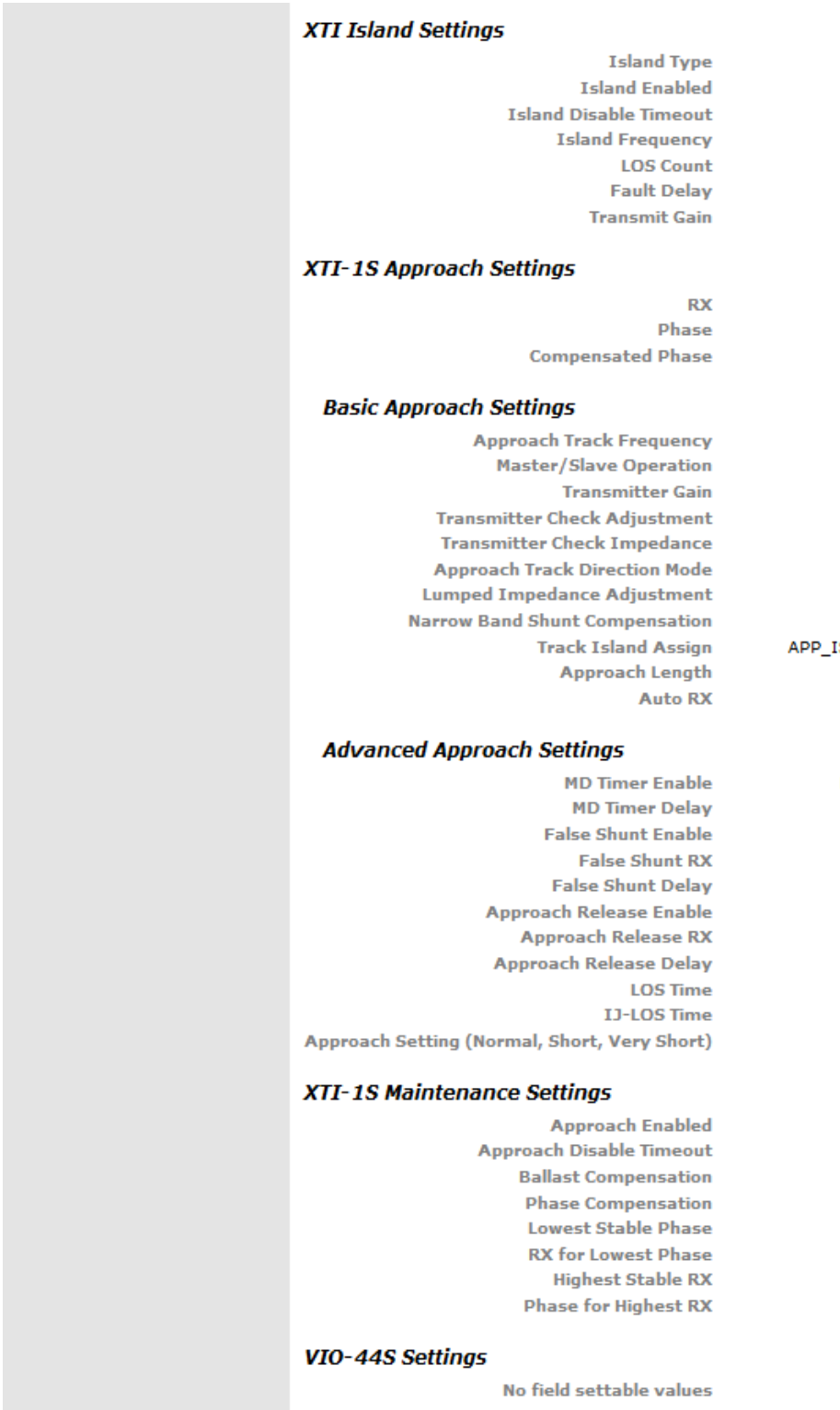

XTI Island Settings

Island Type	Internal
Island Enabled	Enabled
Island Disable Timeout	2 hr
Island Frequency	0
LOS Count	4.0
Fault Delay	2
Transmit Gain	0

XTI-1S Approach Settings

RX	100
Phase	72
Compensated Phase	72

Basic Approach Settings

Approach Track Frequency	86 Hz
Master/Slave Operation	Master
Transmitter Gain	200
Transmitter Check Adjustment	0.0 Ω
Transmitter Check Impedance	0.6
Approach Track Direction Mode	BI
Lumped Impedance Adjustment	0.0
Narrow Band Shunt Compensation	100
Track Island Assign	APP_ISLASSGN
Approach Length	2000 ft
Auto RX	Enabled

Advanced Approach Settings

MD Timer Enable	Disabled
MD Timer Delay	10 min
False Shunt Enable	Enabled
False Shunt RX	80
False Shunt Delay	0 min
Approach Release Enable	Enabled
Approach Release RX	80
Approach Release Delay	60 min
LOS Time	99 sec
IJ-LOS Time	5 sec
Approach Setting (Normal, Short, Very Short)	Short

XTI-1S Maintenance Settings

Approach Enabled	Enabled
Approach Disable Timeout	2 hr
Ballast Compensation	122
Phase Compensation	0
Lowest Stable Phase	72
RX for Lowest Phase	99
Highest Stable RX	100
Phase for Highest RX	72

VIO-44S Settings

No field settable values

Figure 7-20 - Active System Configuration (4) (Cont. on next page)

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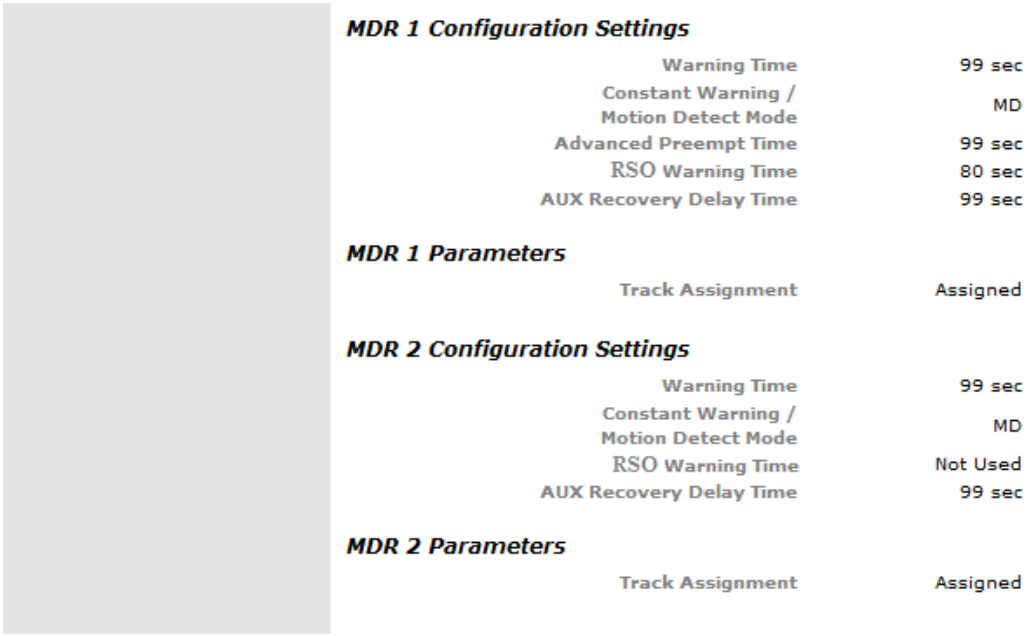
MDR 1 Configuration Settings
Warning Time 99 sec
Constant Warning / Motion Detect Mode MD
Advanced Preempt Time 99 sec
RSO Warning Time 80 sec
AUX Recovery Delay Time 99 sec
MDR 1 Parameters
Track Assignment Assigned
MDR 2 Configuration Settings
Warning Time 99 sec
Constant Warning / Motion Detect Mode MD
RSO Warning Time Not Used
AUX Recovery Delay Time 99 sec
MDR 2 Parameters
Track Assignment Assigned

Figure 7-21, Configuration - System Configuration (5)

System Time

The System Time page is used to change the current time and the Time Sync Source options. The following table shows the system tim options:

System Time Synchronization Options		
Time Sync Source	**Settings**	**Description**
None	N/A	No external time synchronization
Code Line	N/A	Accept external time updates from the codeline protocol. (ATCS, GENISYS)
Vital Remote	N/A	Accept external Time updates from the vital remote connection
EMP	• EMP Time Server IP Address • EMP Time Server Port number • Time Zone Settings • Daylight Savings Time settings	Accept external PTC Time update from PTC EMP Class C multicast messages

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SNTP	• Time update period • SNTP Server 1 IP address • SNTP Server 1 IP address • Time Zone Settings • Daylight Savings Time settings	Query up to two external SNTP servers for time. Use the second Address if the first does not respond.

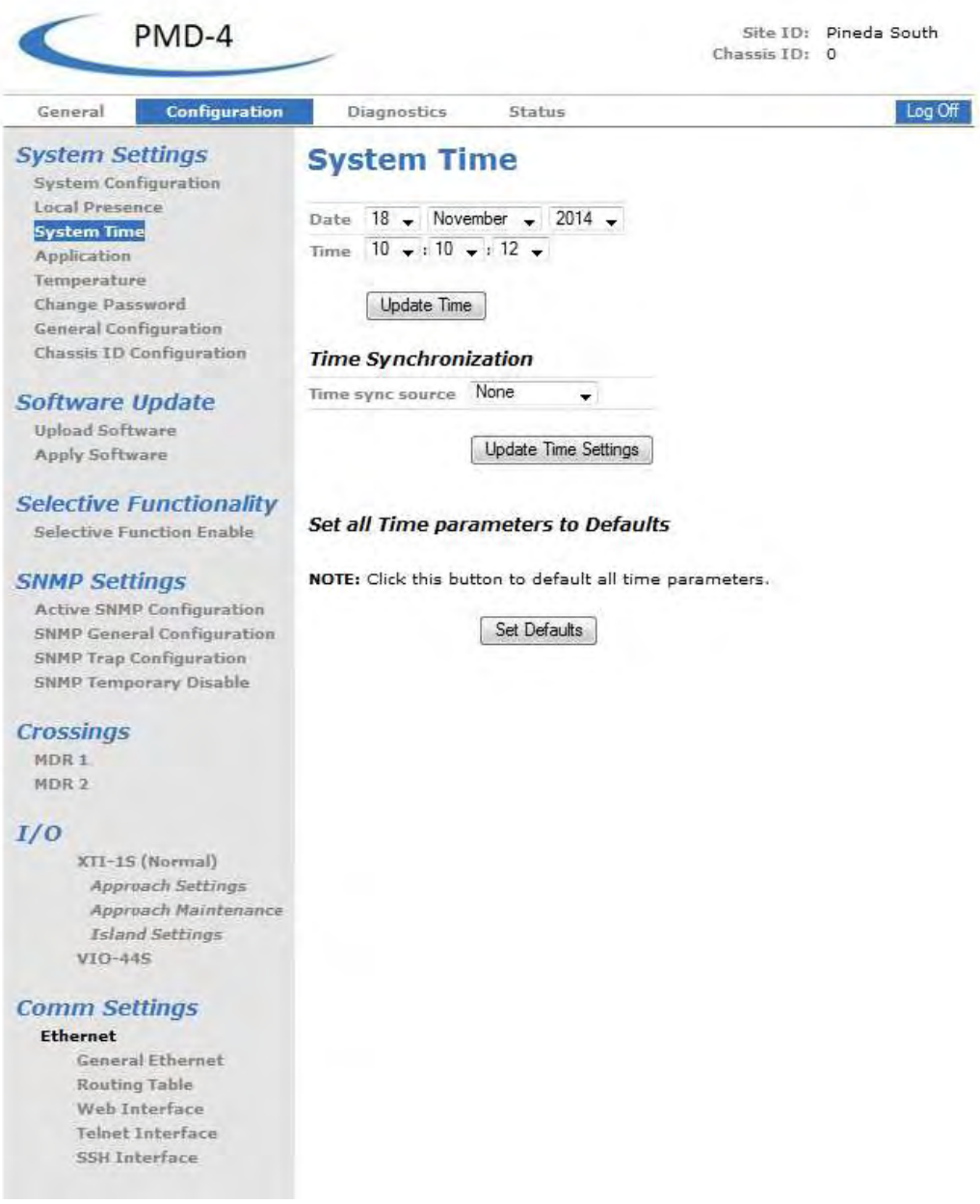

Figure 7-22, Configuration - System Time

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EMP Time Parameters

If EMP is selected as the source of Time Update, this page provides the entry of parameters associated with EMP Time Synchronization.

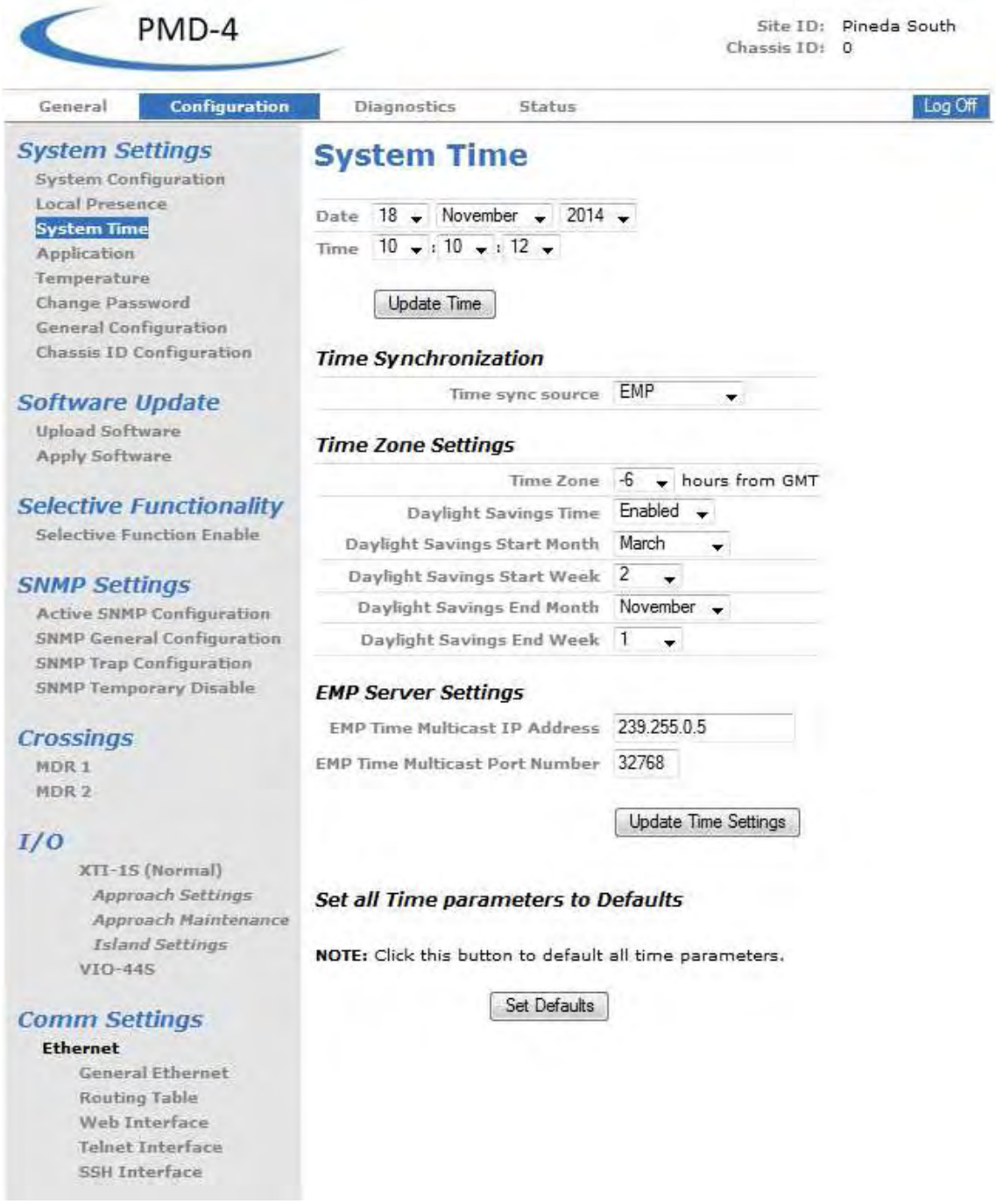

Figure 7-23, Configuration System Time EMP

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SNTP Time Parameters

If SNTP is selected as the source of Time Update, this page provides the entry of parameters associated with SNTP Time Synchronization.

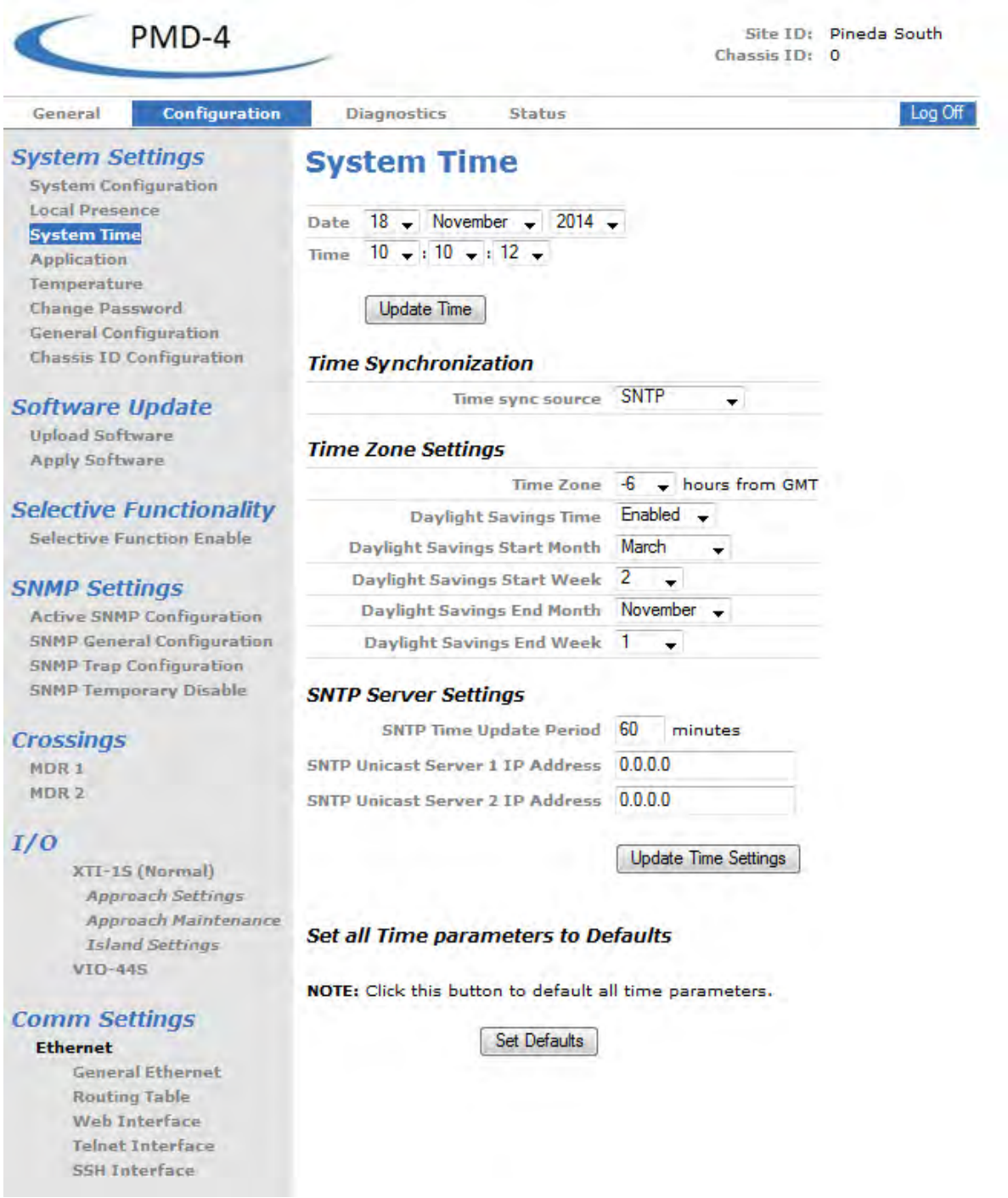

Figure 7-24, Configuration System Time SNTP

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Application

The Application page displays the currently operating application pair. If Local Presence is established, the new applications may be selected from the drop-down list. Note that after the new application selections are confirmed, the PMD-4 resets causing a user log out.

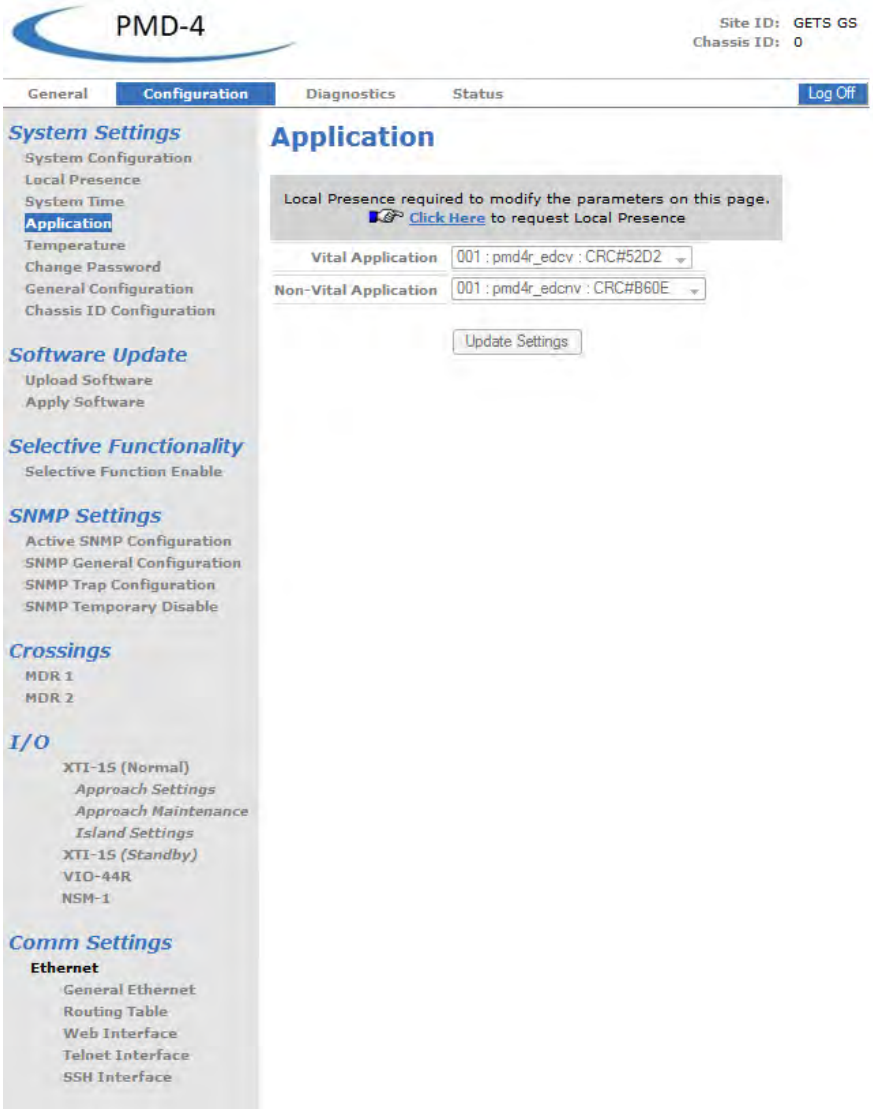

Figure 7-25, Configuration – Application

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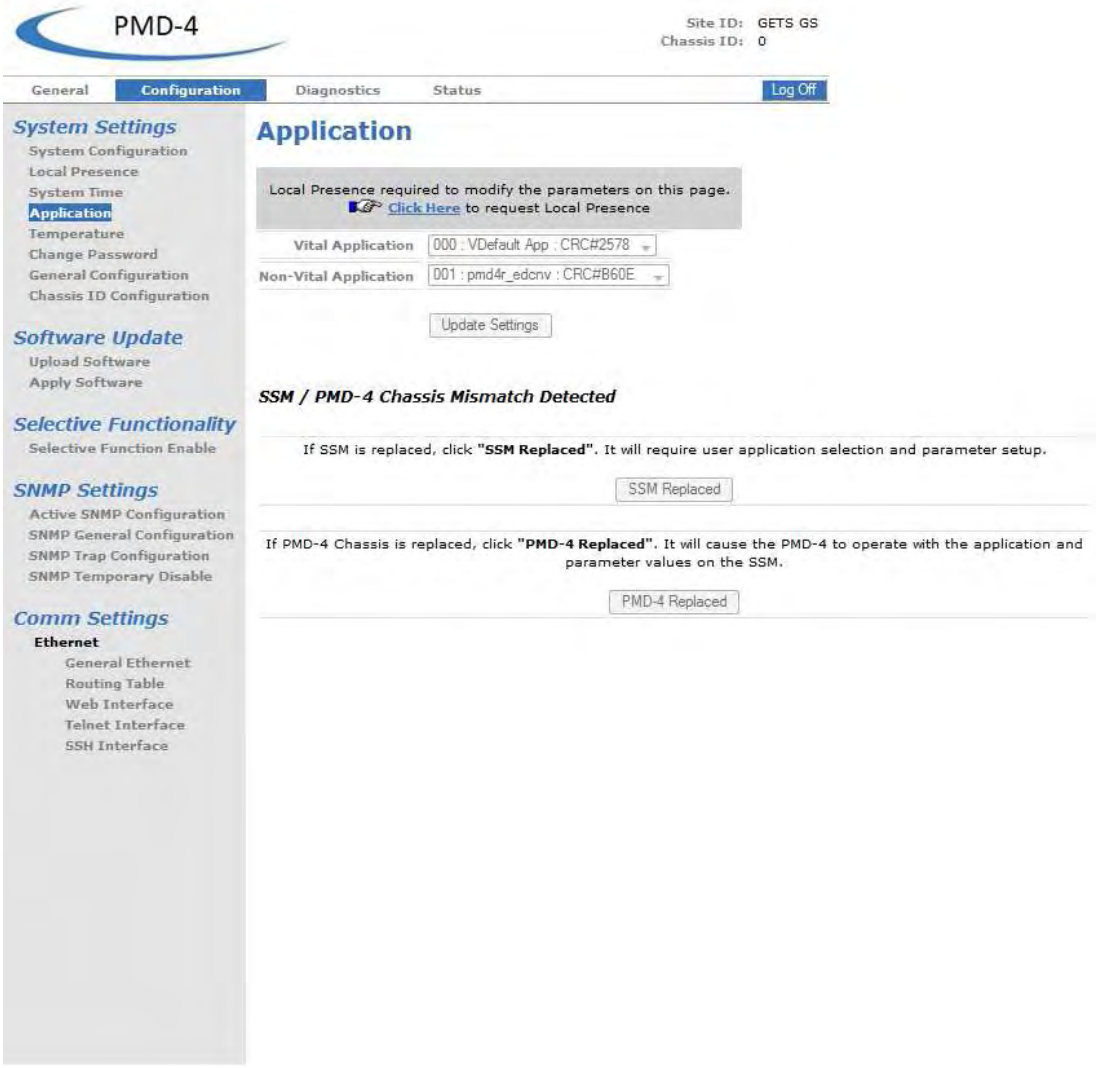

Figure 7-26, Configuration – Application(When SSM Or PMD-4 Chassis Was Changed).

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Temperature

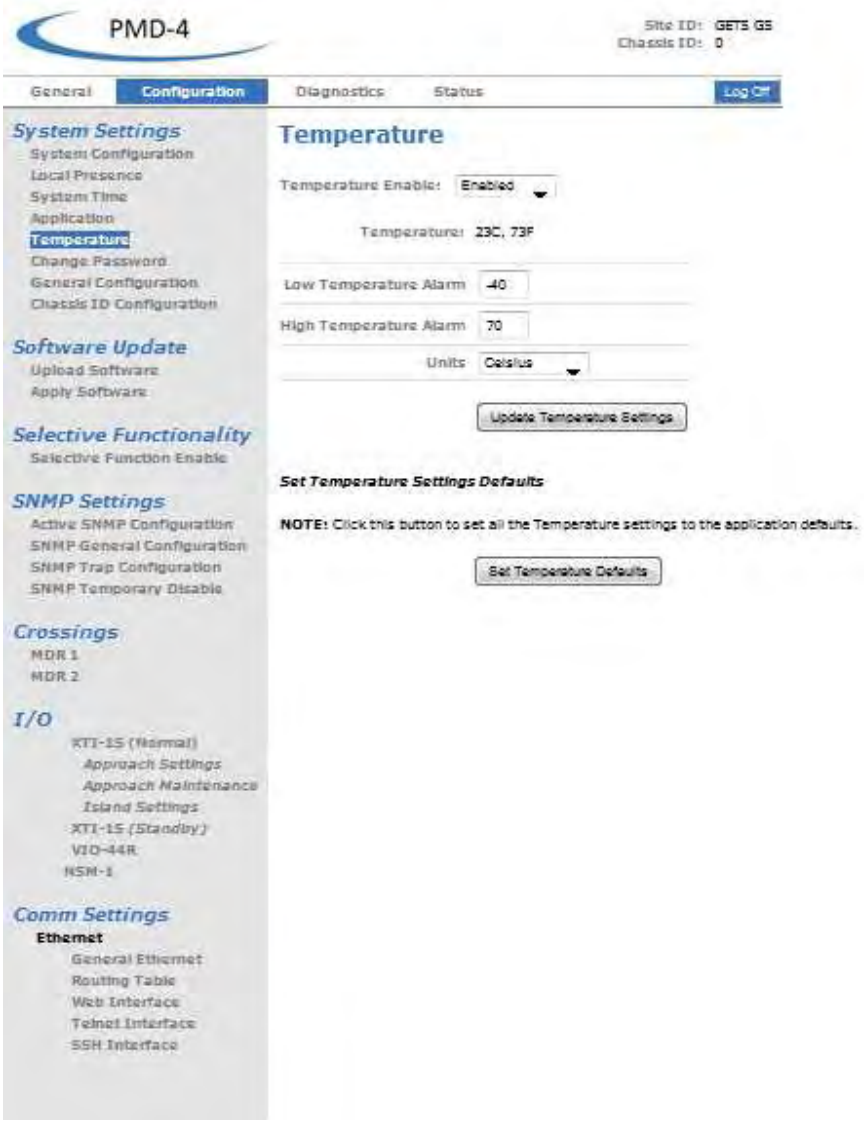

Figure 7-26a, Configuration – Temperature

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Change Password

The Change Password page allows the password to be set to a new value. The new password value may be any length of up to 32 characters.

WARNING *Unauthorized modification of PMD-4/4R parameters or configuration may result in unsafe conditions that could result in death or serious injury. Responsibility for security of passwords for equipment access lies with the railway authority. Passwords should be of a non-obvious nature and of sufficient length to preclude an unauthorized user from easily guessing the password. Reference SRAC2.*

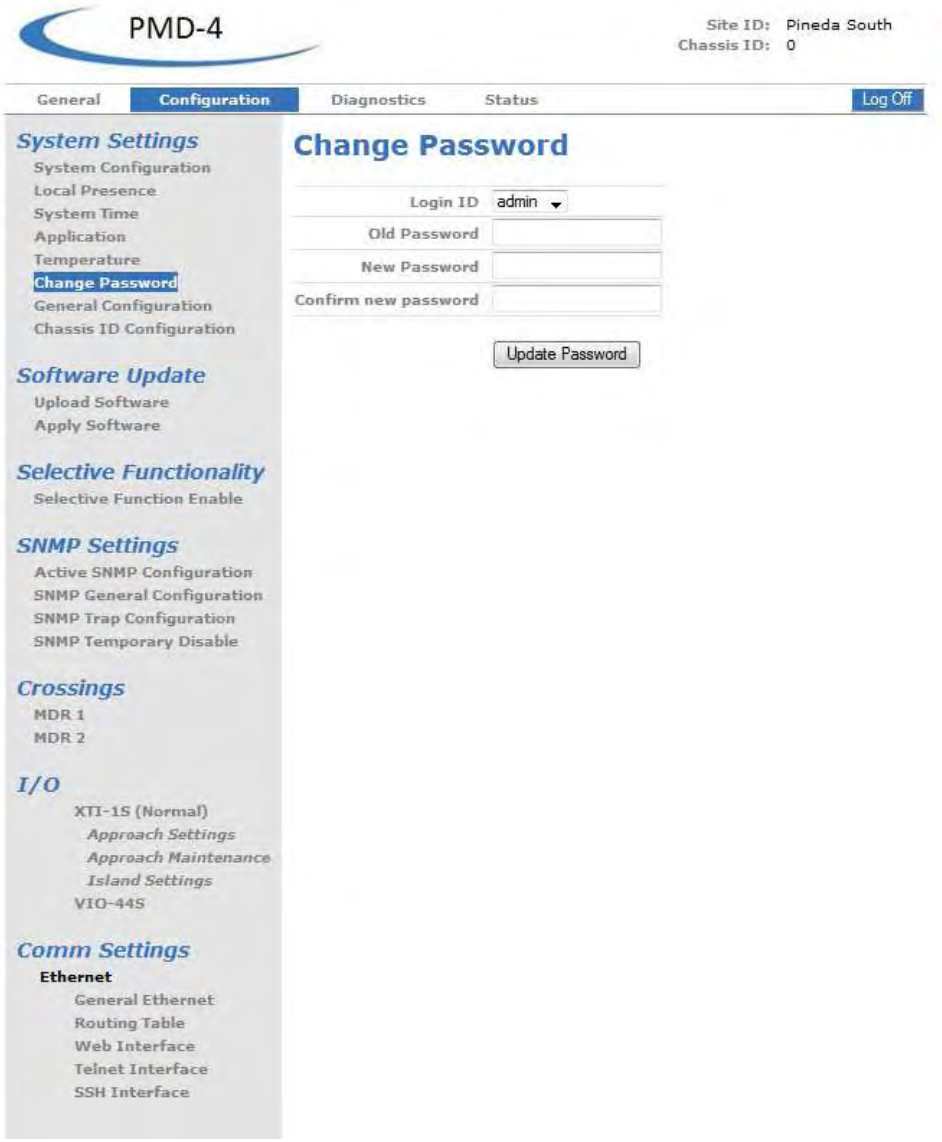

Figure 7-27, Configuration - Change Password

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General Configuration

The General Configuration displays and allows modification of the Site ID parameter for the unit.

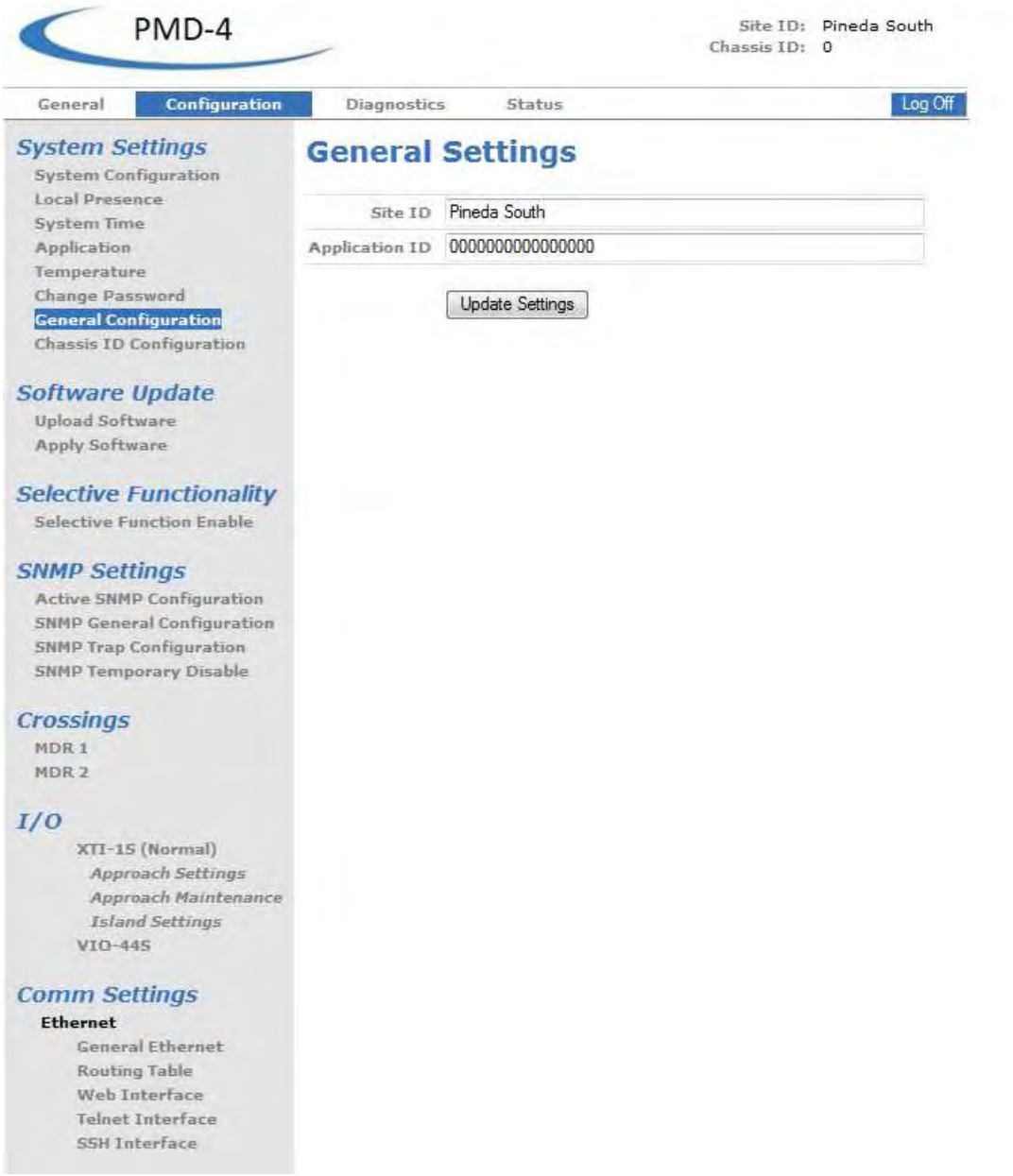

Figure 7-28, Configuration - General Configuration

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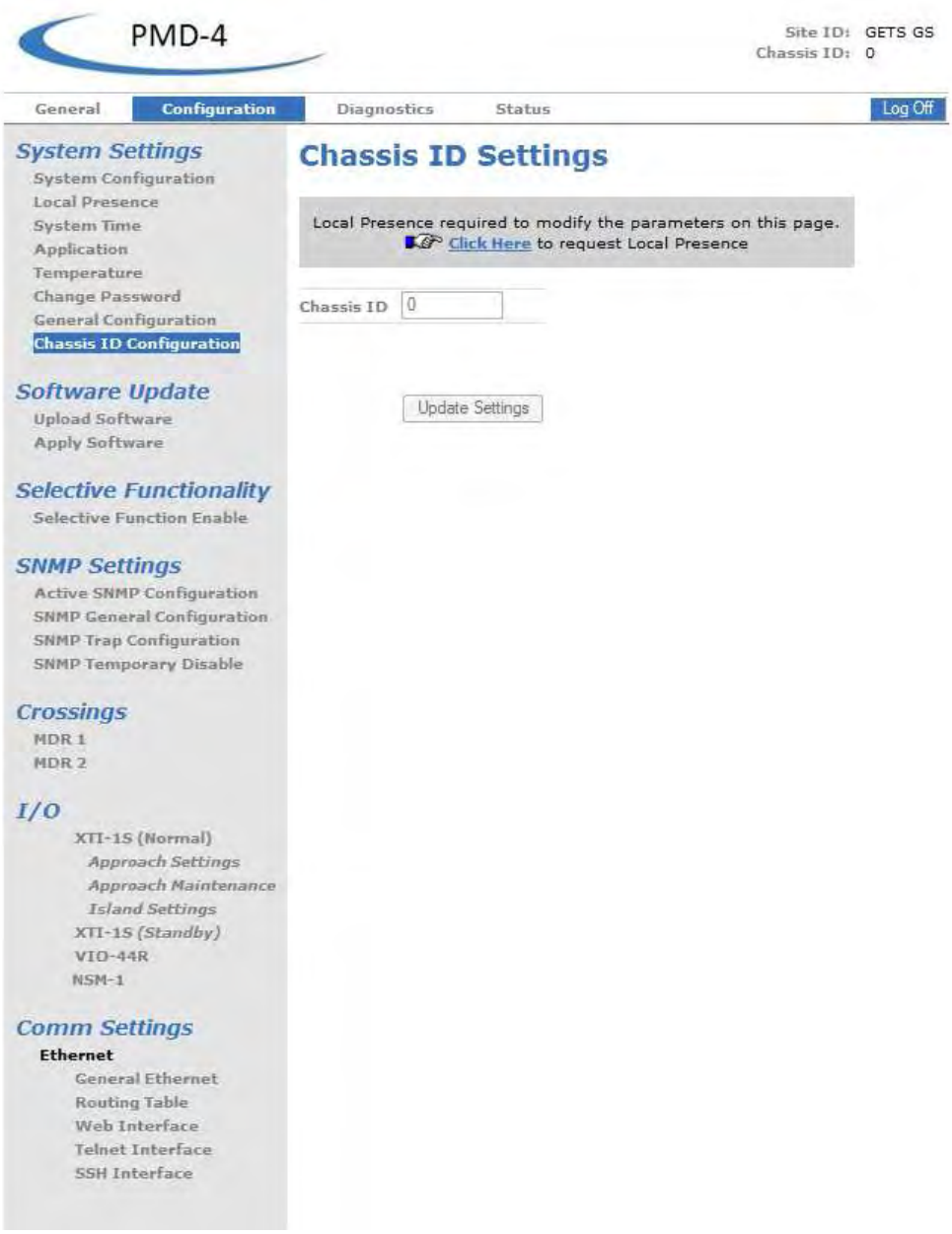

Figure 7-28a, Configuration – Chassis ID Configuration

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Vital Timers

The Vital Timers page displays the current settings and ranges allowed for the individual timers. If Local Presence is established, the timer values may be modified to any value within the application defined range. Navigation aids (the page drop-down list and the Prev / Next page and First / Last page buttons) are provided for situations where the number of timers in the application is large and must be displayed on more than one web page.

WARNING *For Vital Timers of 4 seconds or more, accuracy will be within +10%/-0%.*

For Vital Timers of less than 4 seconds, accuracy will be within +0.5 second under worst case timing conditions. Reference SRAC2.

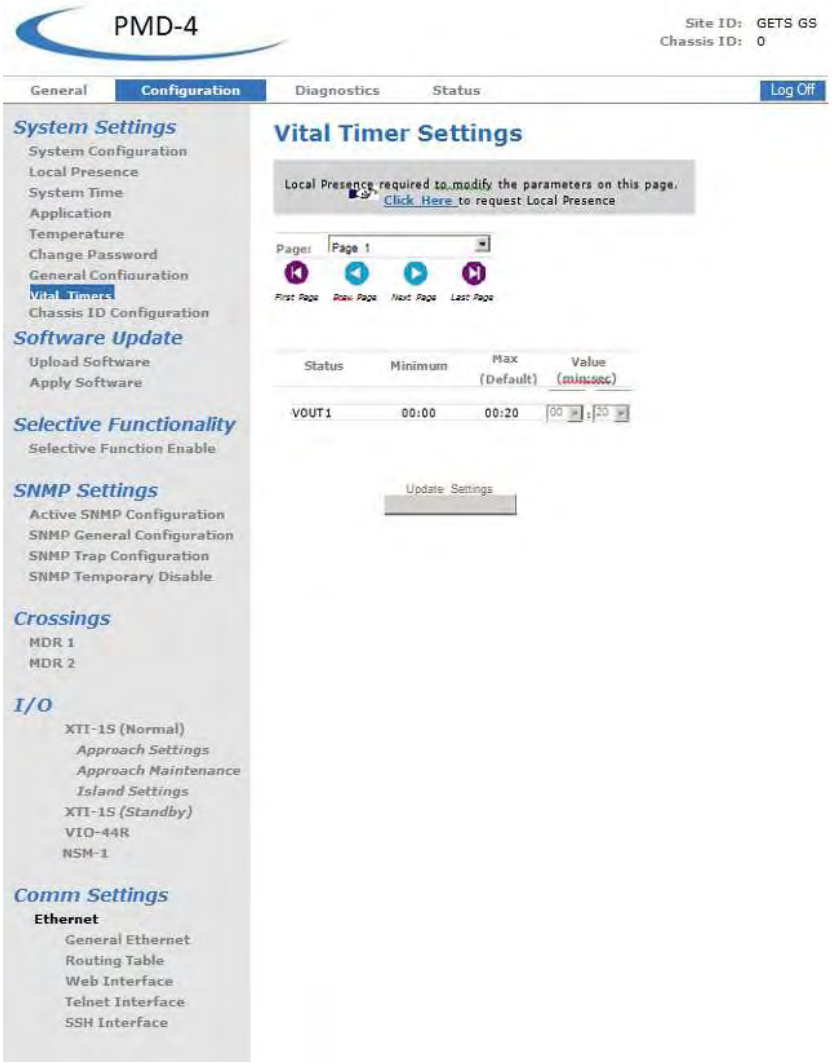

Figure 7-28, Configuration - Vital Timers

Non-Vital Timers

The Non-Vital Timers page operates identically to the Vital Timers page with the exception that Local Presence is not required to change the timer values.

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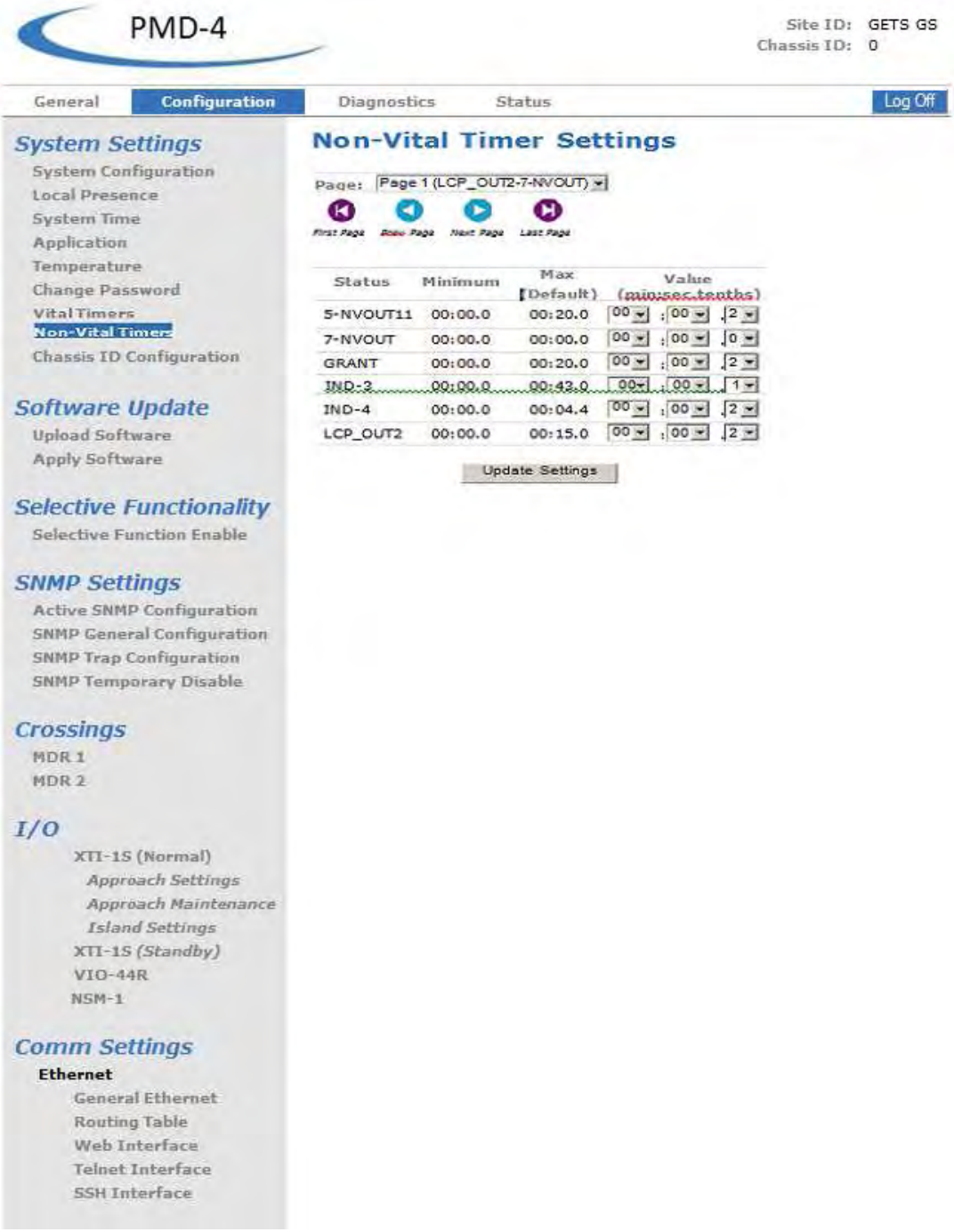

Figure 7-28, Configuration - Non-Vital Timers

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The Vital Configuration page displays the current values for the Vital Configuration Settings. If Local Presence is established, the values of the settings may be modified.

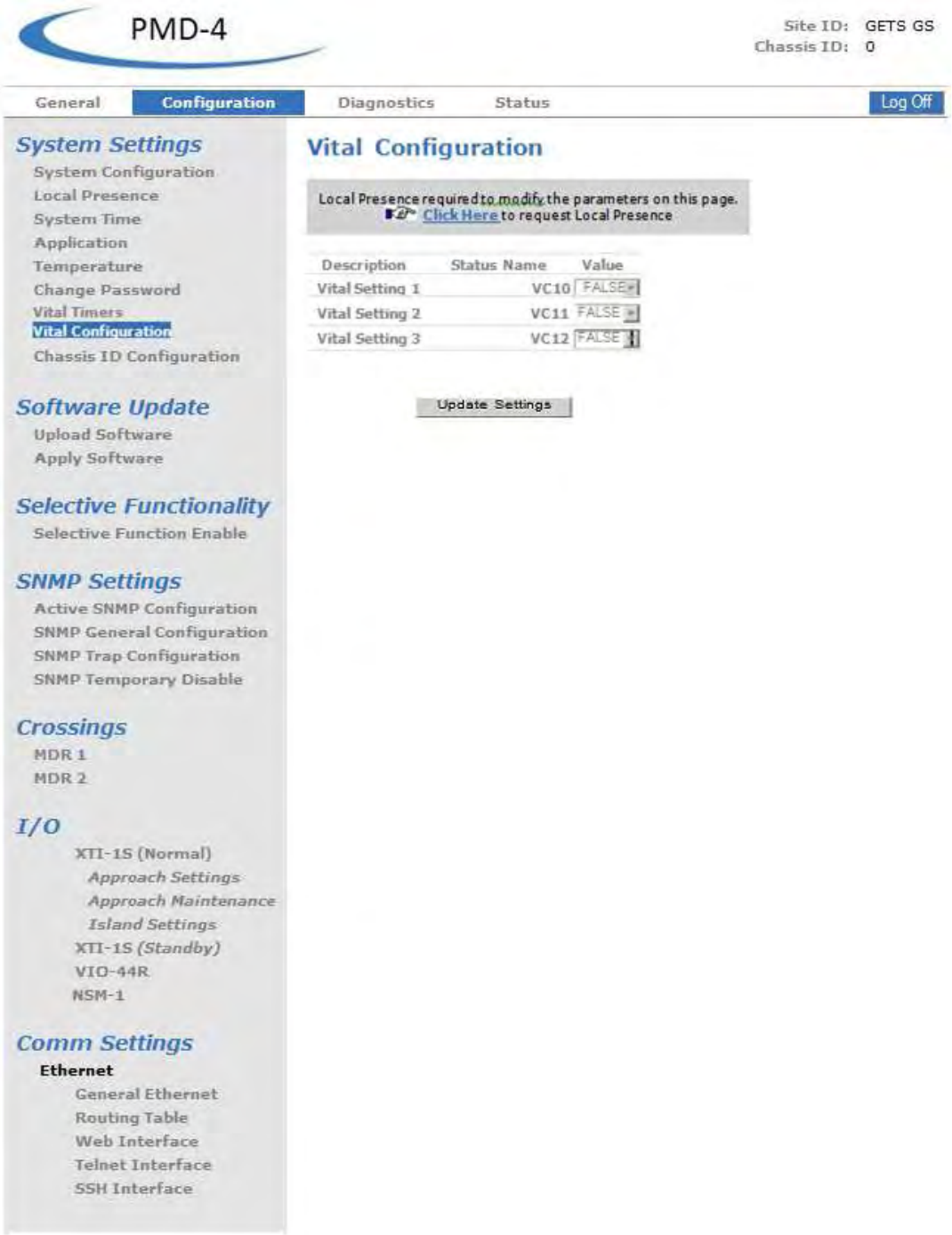

Figure 7-29, Configuration - Vital Configuration

Software Update

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These pages provide information needed to upload and apply PTC configuration and mapping files to the PMD-4/4R. The initial page displays information of the current files, if present. If Local Presence is established, new files may be specified and uploaded to the PMD-4/4R, as shown in Fig. 7-11/7-12. Once uploaded, the file(s) may be applied to be stored permanently, as shown in Fig. 7-30.

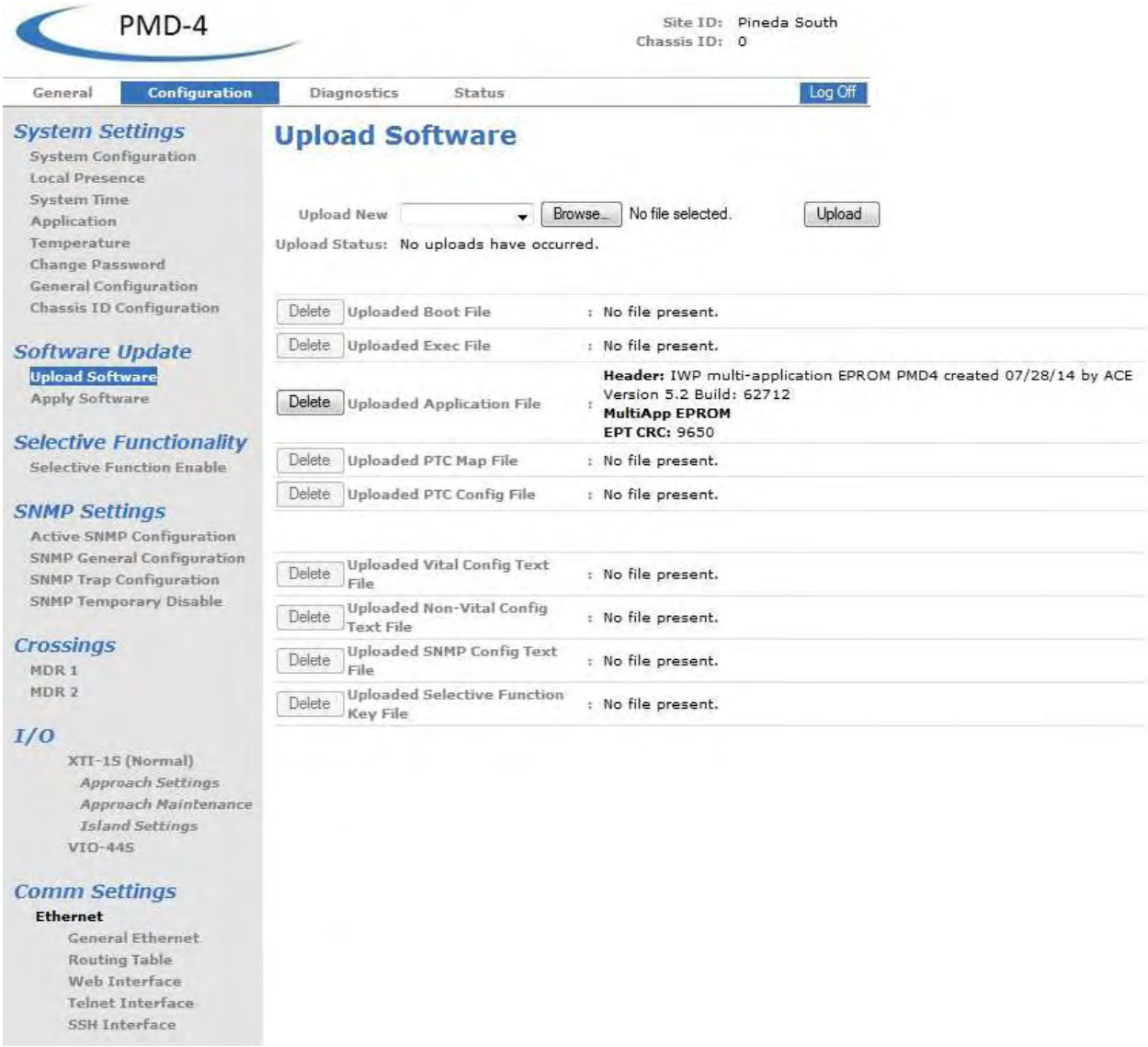

Figure 7-30, Configuration Software Upload

Note: *Save all log files prior to upgrading Executive Software.*

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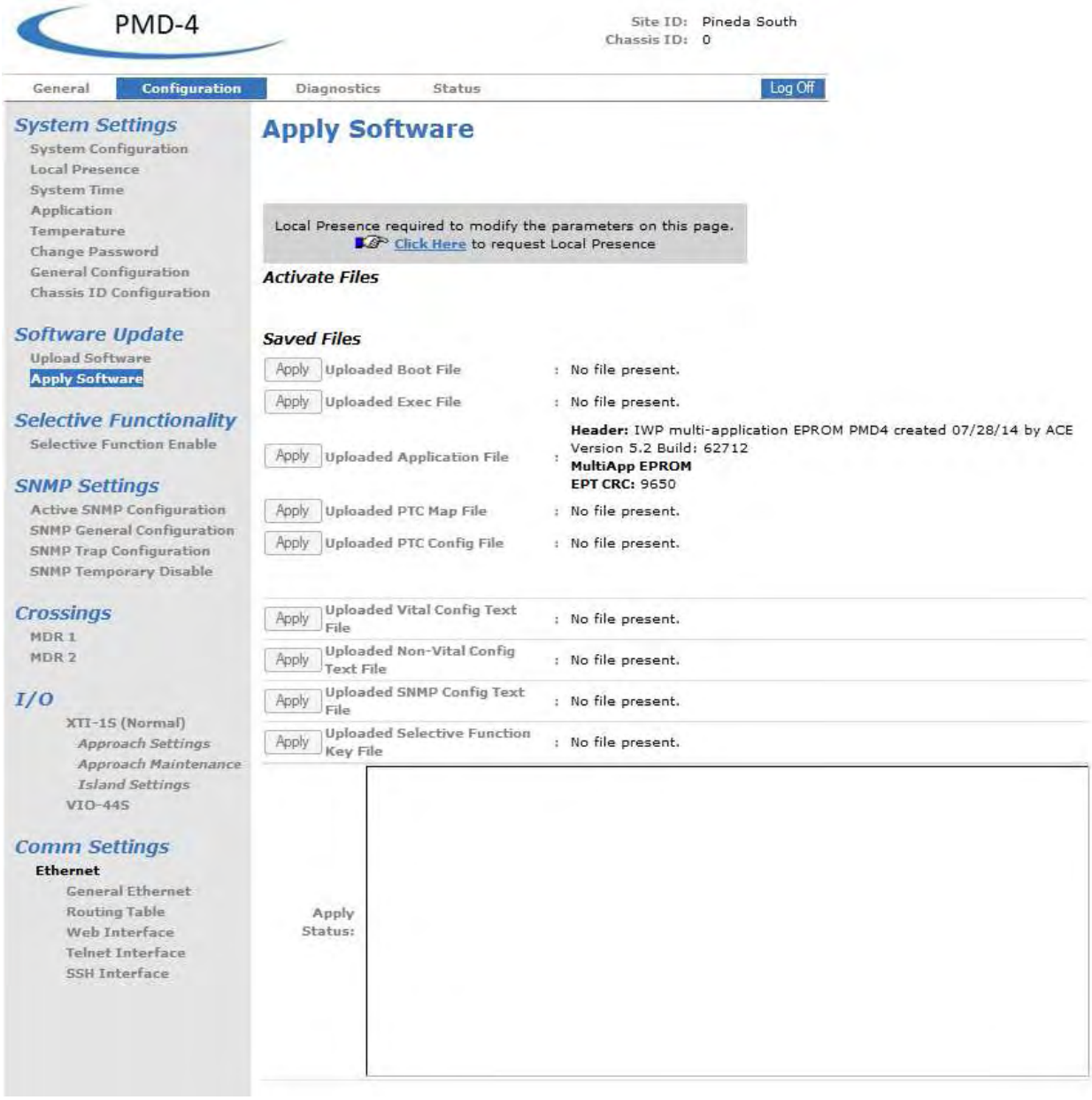

Figure 7-31, Configuration Software Apply

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Boot loader Update Mode

This page provides the following capabilities:

1. Inspecting boot loader version of the executive software installed.
2. Upload updates to Execute/Boot software.
3. Upload updates to Application Software and PTC mapping files.
4. Manage the PMD-4 SSM program flash.
    - Erase Application
    - Erase PTC Files
    - Erase Configuration Data
    - Format Error Log Flash
    - Format Program Flash
    - Format the SSM Module.

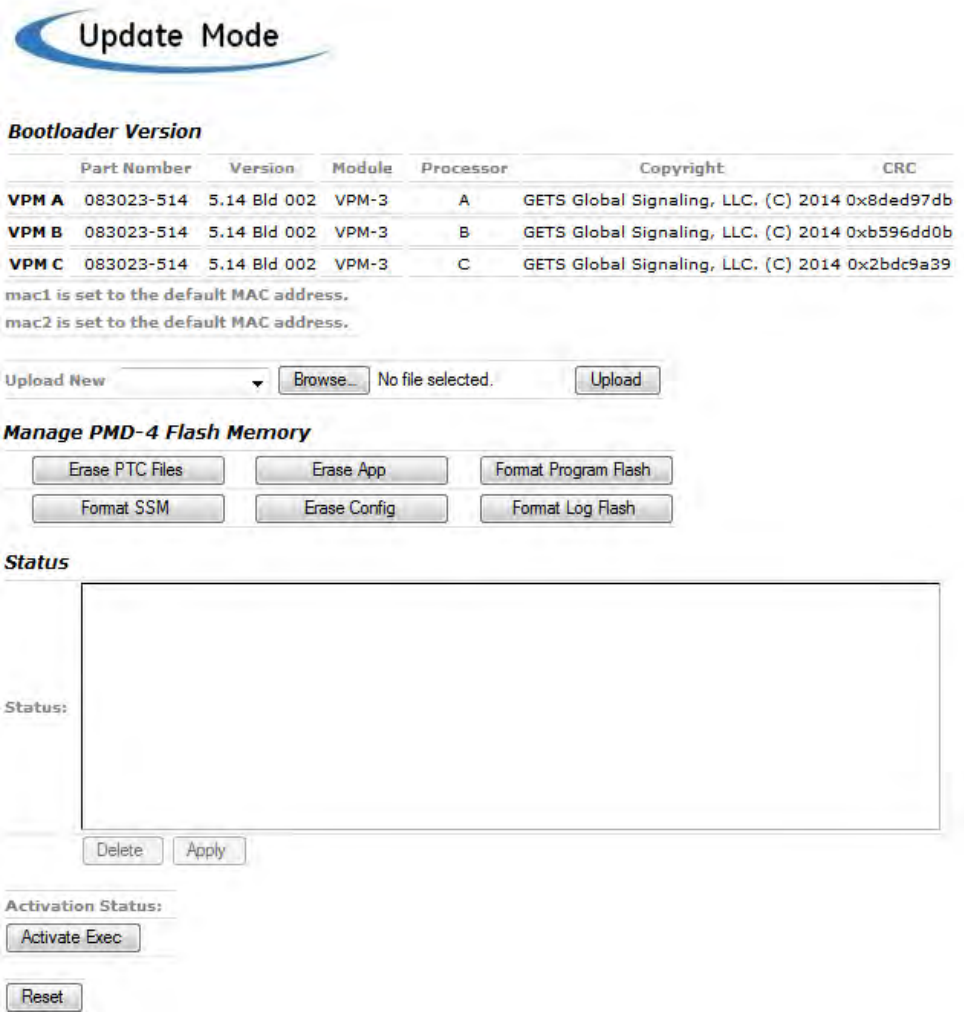
Update Mode
Bootloader Version
Part Number Version Module Processor Copyright CRC
VPM A 083023-514 5.14 Bld 002 VPM-3 A GETS Global Signaling, LLC. (C) 2014 0x8ded97db
VPM B 083023-514 5.14 Bld 002 VPM-3 B GETS Global Signaling, LLC. (C) 2014 0xb596dd0b
VPM C 083023-514 5.14 Bld 002 VPM-3 C GETS Global Signaling, LLC. (C) 2014 0x2bdc9a39
mac1 is set to the default MAC address.
mac2 is set to the default MAC address.
Upload New
Browse...
No file selected.
Upload
Manage PMD-4 Flash Memory
Erase PTC Files
Erase App
Format Program Flash
Format SSM
Erase Config
Format Log Flash
Status
Status:
Delete
Apply
Activation Status:
Activate Exec
Reset

Figure 7-31a, Update Mode Screen

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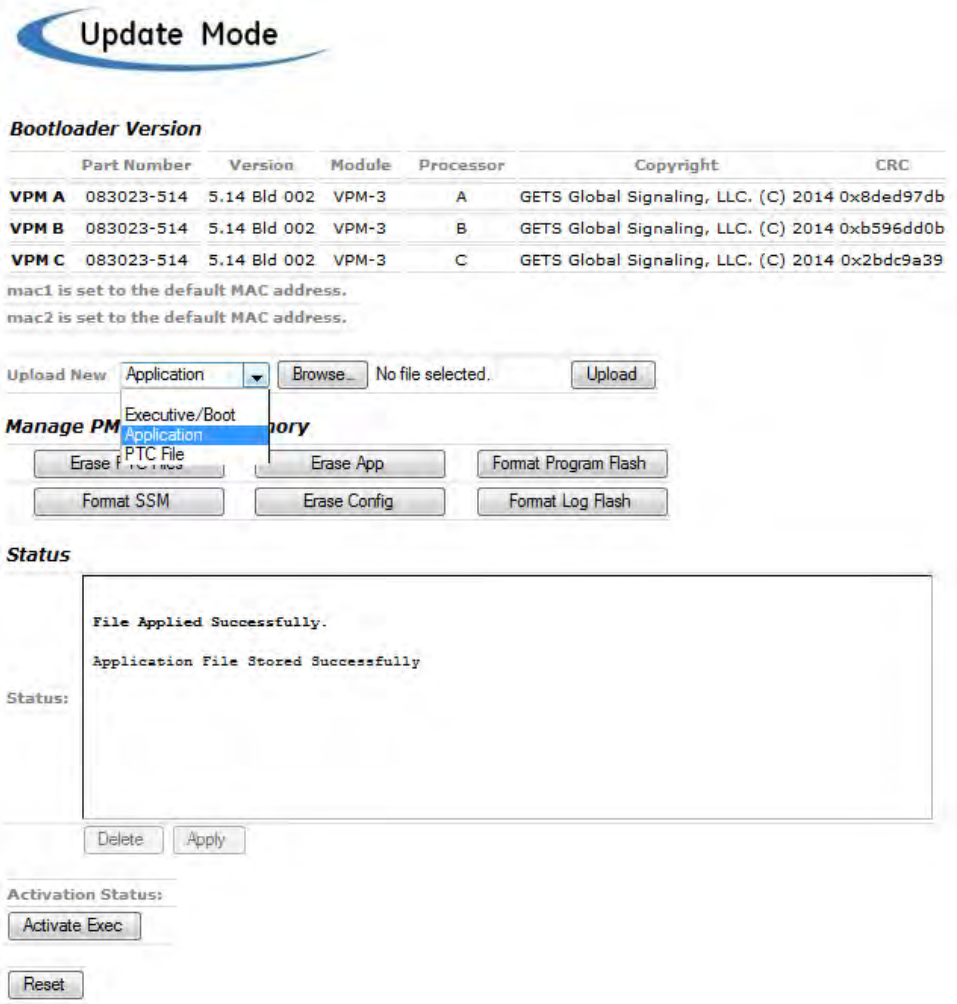

Figure 7-31b, Update Mode – Application Loaded

Selective Functionality

These pages provide information needed to enter an authorization key which unlocks upgrade features for the PMD-4 product. Authorization keys are provided to activate the upgrade feature. The limited predictor feature is one such product for the PMD-4 which enables constant warning prediction mode from standard motion detector PMD-4 operation. With this feature upgrade, the standard PMD-4 product has the added capability of CW mode, LIA and additional MDR.

The compliment of upgrade features available via selective function are listed below:

1. PMD-4 Limited Predictor(Adds CW, LIA and additional MDR)
2. Class D High Availability (Adds advanced multiple IP messaging)
3. Wireless Crossings(Adds wireless crossing activation capability)
4. System Management (Adds advanced SNMP traps)
5. Secure Shell Interface (Adds advanced client capability)

For more details on these features, contact your local GE sales reprehensive.

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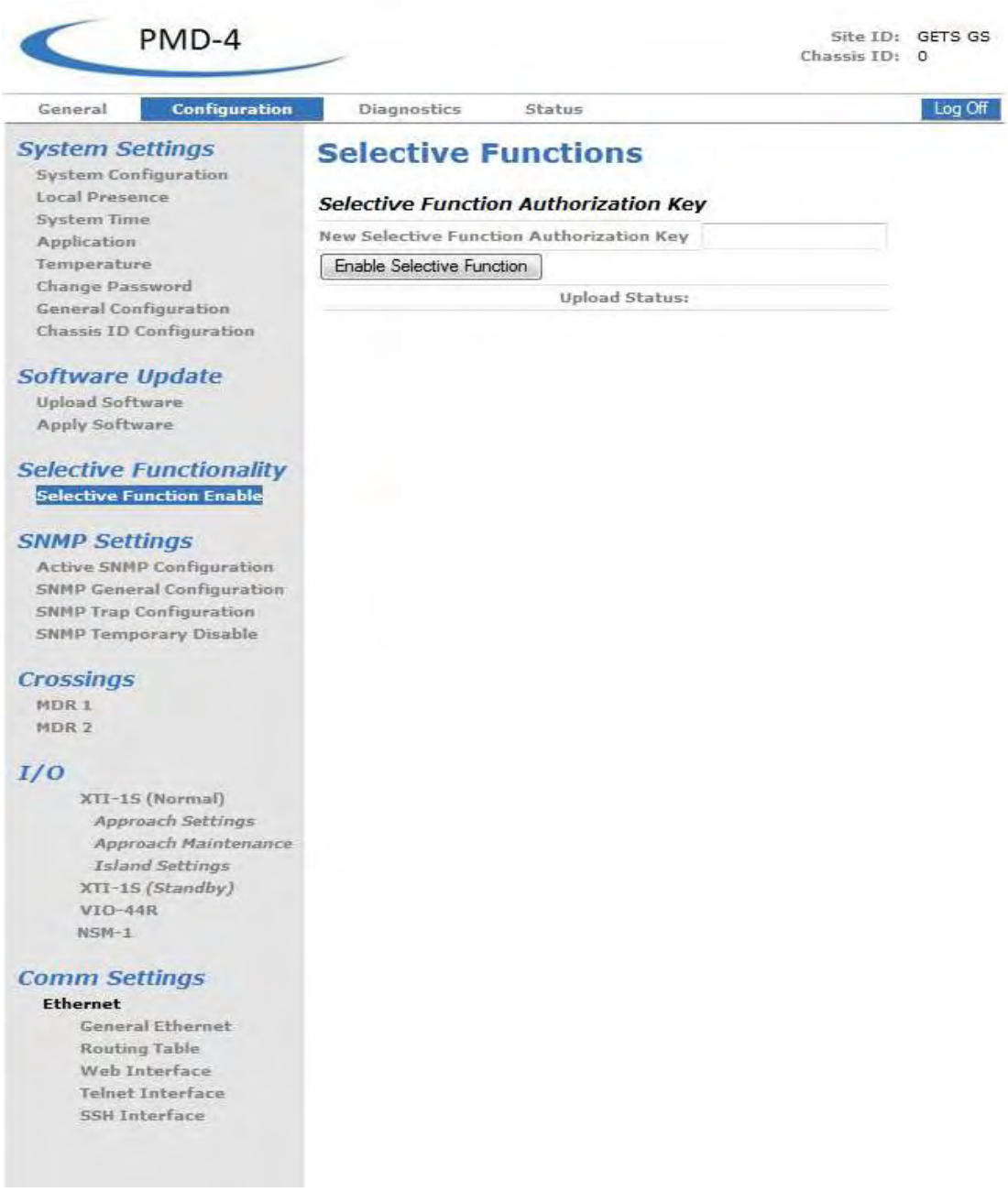

Figure 7-31a, Selective Function Menu

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SNMP Settings

These pages provide information needed for the operation of the PMD-4/4R Simple Management Protocol (SNMP) functionality.

General SNMP Configuration

The General SNMP Configuration page is used to set up the SNMP destination IP addresses, SNMP UDP ports, SNMP Trap Enable, Public and Private community strings, and location and device identification parameters. This page lets the user enable and disable the SNMP functionality and upload and download SNMP configuration files. The SNMP parameters are stored in flash memory on the SSM module.

The SNMP configuration files are created by first downloading the current SNMP configuration. This file can be archived and uploaded to other PMD-4/4R to duplicate the current configuration at other sites.

The following General SNMP Configuration parameters define the SNMP operations and apply to all the SNMP Traps defined in the system:

Destination IP 1	IP address of the network management system receiving the traps – Default value 0.0.0.0
Destination IP 2	IP address of the alternate network management system receiving the traps – Default value 0.0.0.0
Destination UDP Port 1	UDP port (161, 162) selectable of the network management system receiving the traps – Default value 162
Destination UDP Port 2	UDP port (161, 162) selectable of the alternate network management system receiving the traps – Default value 162
Wayside Device Type	Wayside equipment type associated with this WIU. Defaults to the WIU Device. (ElectroLogIXS)
Location	String used to define the local unit. It defaults to the Site ID.
SNMP Trap Enable	Indicates if SNMP is active – Defaults to Disabled
SNMP Configuration File	File name and path of the SNMP configuration file.

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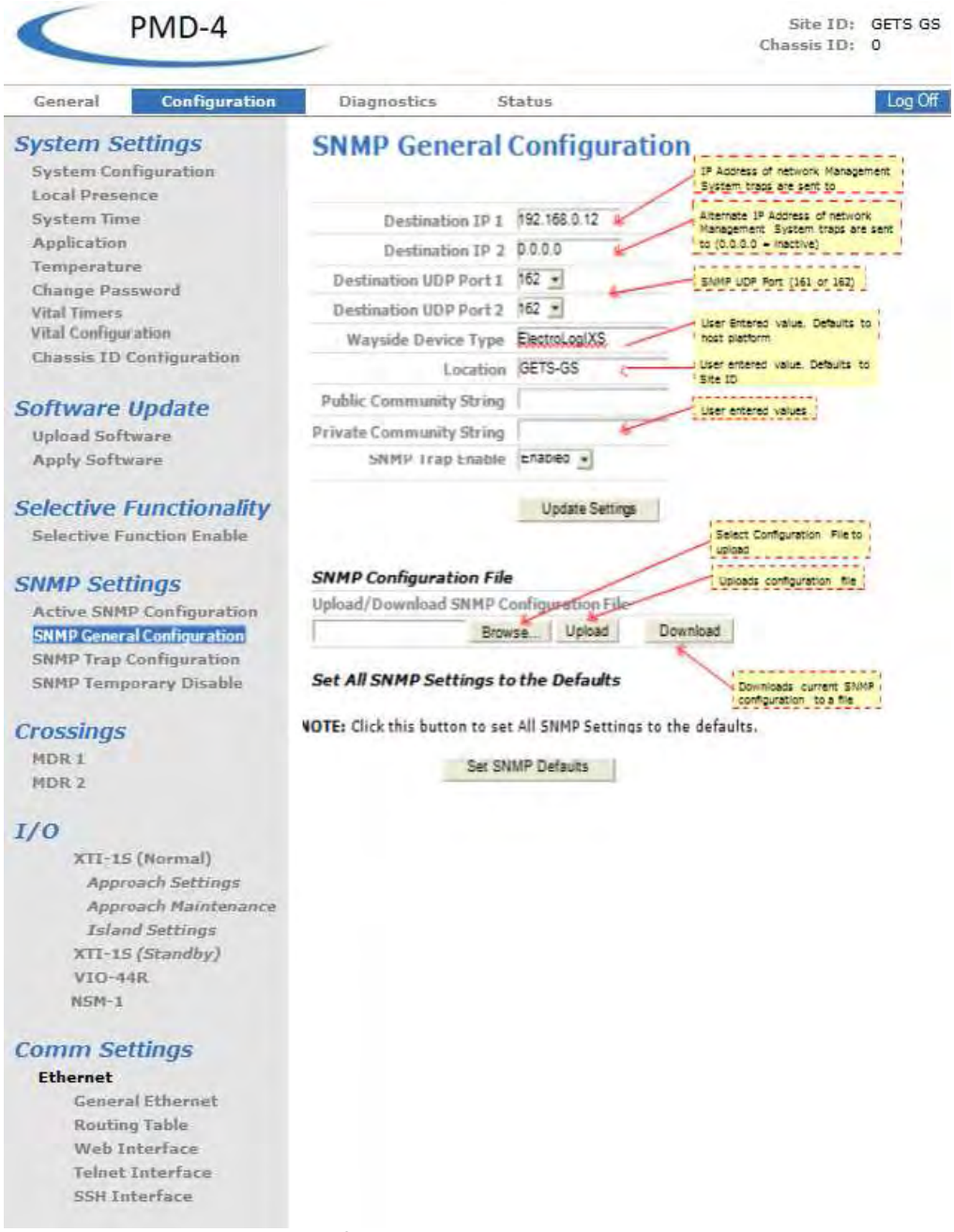

Figure 7-32 - General SNMP Configuration

SNMP Trap Configuration

The SNMP Trap Configuration page allows customizing each individual trap in the system. Each trap may have one or more specific traps with user editable fields. Enabling and disabling a Trap enables or disables all the specific traps associated with the Trap. Each specific trap can be enabled or disabled individually. User enterable fields are provided to allow customizing the trap information set for a specific network management system.

Depending on the trap, a trap can have an associated clear trap that is sent when the condition that caused the trap no longer applies. For example, if a Communications Link trap is sent when a

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Vital Remote Link Error alarm is detected. The Communications Link trap clear can be set so that the clear is sent when the Vital Remote Link Error alarm is cleared.

The following SNMP Trap Configuration parameters allow customization of the traps:

Trap Name	Dropdown list of all generic trap names
Trap Enable	Enables the Trap defined by Trap Name
Alert - Configuration data associated with the Alert trap	
Trap Text	user modifiable text field describing the trap
Number of Occurrences	If applicable, lets the user define the number of times the event has to occur in the time period defined by Time before the trap will be sent
Time	If applicable, lets the user define the period of time an alert condition has to exist before a trap will be sent. May be used in conjunction with Number of Occurrences
Clear - Configuration data associated with the Clear trap for an alert	
Trap Text	user modifiable text field describing the trap
Number of Occurrences	If applicable, lets the user define the number of times the event has to occur in the time period defined by Time before the clear trap will be sent
Time	If applicable, lets the use define the period of time an alert condition has to exist before a clear trap will be sent. May be used in conjunction with Number of Occurrences
Specific Trap Name	Dropdown list of Specific Traps for the selected Generic Trap
Specific Trap Enable	Enables the specific trap defined by Specific Trap Name
Trap ID	User editable Trap ID. Trap ID must be unique for each specific trap.
Alert Specific Data	
Reason	Fixed field denoting the reason for the trap
Flag	User editable number providing an additional identifier
Priority	User editable priority field
Text Field 1	User editable text field
Text Field 2	User editable text field
Clear Specific Data	
Trap ID	User editable Clear Trap ID. The system ensures that all are unique between all traps and clear traps
Reason	Fixed field denoting the reason for the trap
Flag	User editable number providing an additional numeric identifier System ensures that this field is different than the Priority associated with the alert.
Priority	User editable priority field
Text Field 1	User editable text field
Text Field 2	User editable text field

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The following traps are defined in the system:

- Communications Link – Vital Remote Link Error, LCP Link Down, Office Code Fail, Office Link Fail, Duplicate MAC Detected, Duplicate IP Address Detected
- Communications Link Clear
- Configuration Change – Vital Configuration Change, Non-Vital Configuration Change
- Crossing Alarm – Crossing High Signal Fault, Crossing Low Phase Fault, Transmitter Check Alarm, Crossing Track Circuit Calibration Required, Crossing Parameters Defaulted, Decreasing Phase Fault, Approach Release Fault, False Shunt Fault,
- Crossing Alarm Clear
- Signaling Alarm – Light Out Detected, Open Track Circuit Detected
- Signaling Alarm Clear
- System Health – Module Health, Module Removed, Module Not Installed
- System Health Clear
- WIU Health –Processor Reset, Program Flash error, Log flash error
- WIU Health Clear
- WIU Heartbeat – Generic trap sent when Time elapses

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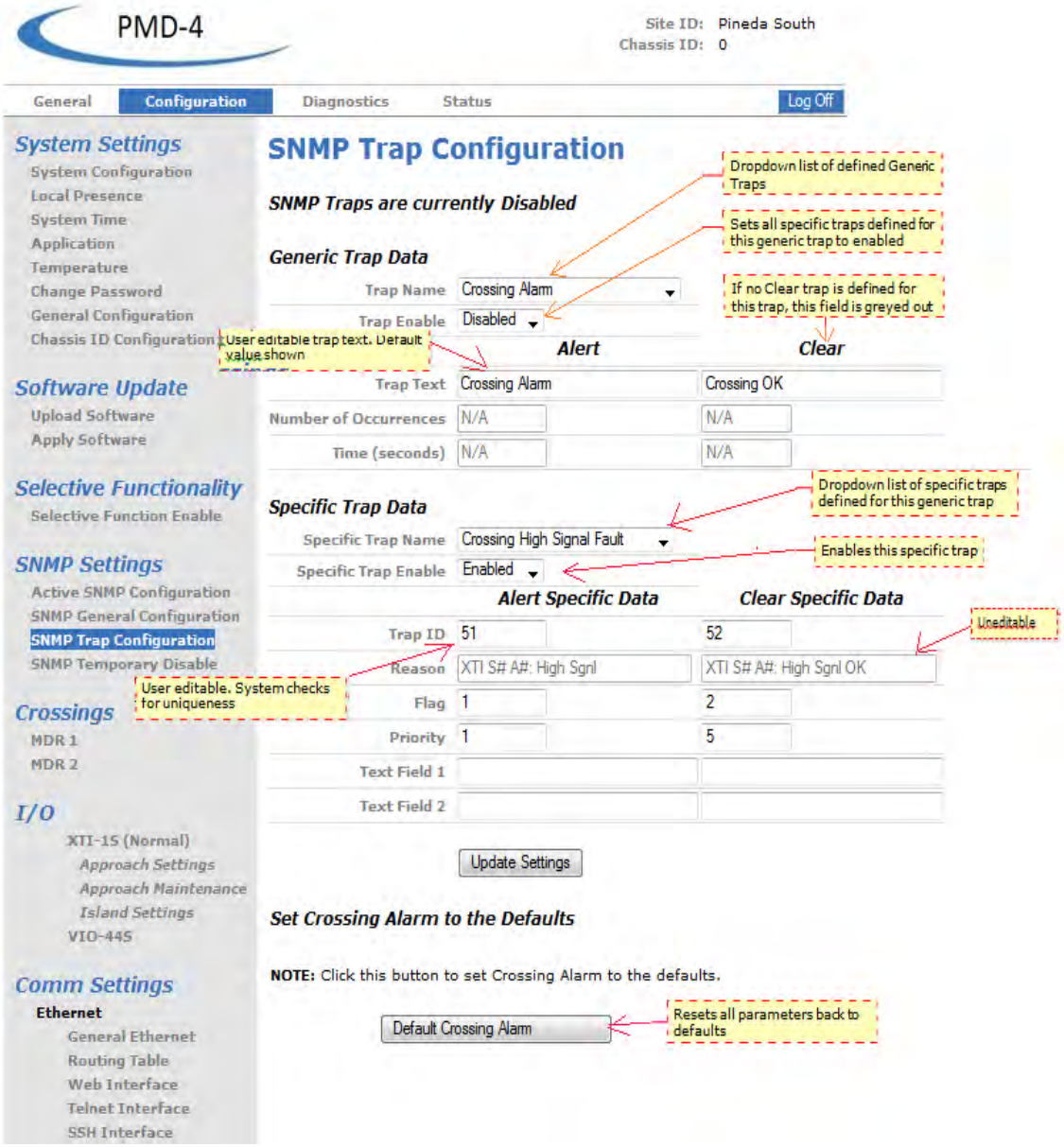

Figure 7-33 - SNMP Trap Configuration

Active SNMP Configuration

The Active SNMP Configuration Page shows all the current SNMP general and trap configuration settings. These are the same parameters that are downloaded to the SNMP configuration file

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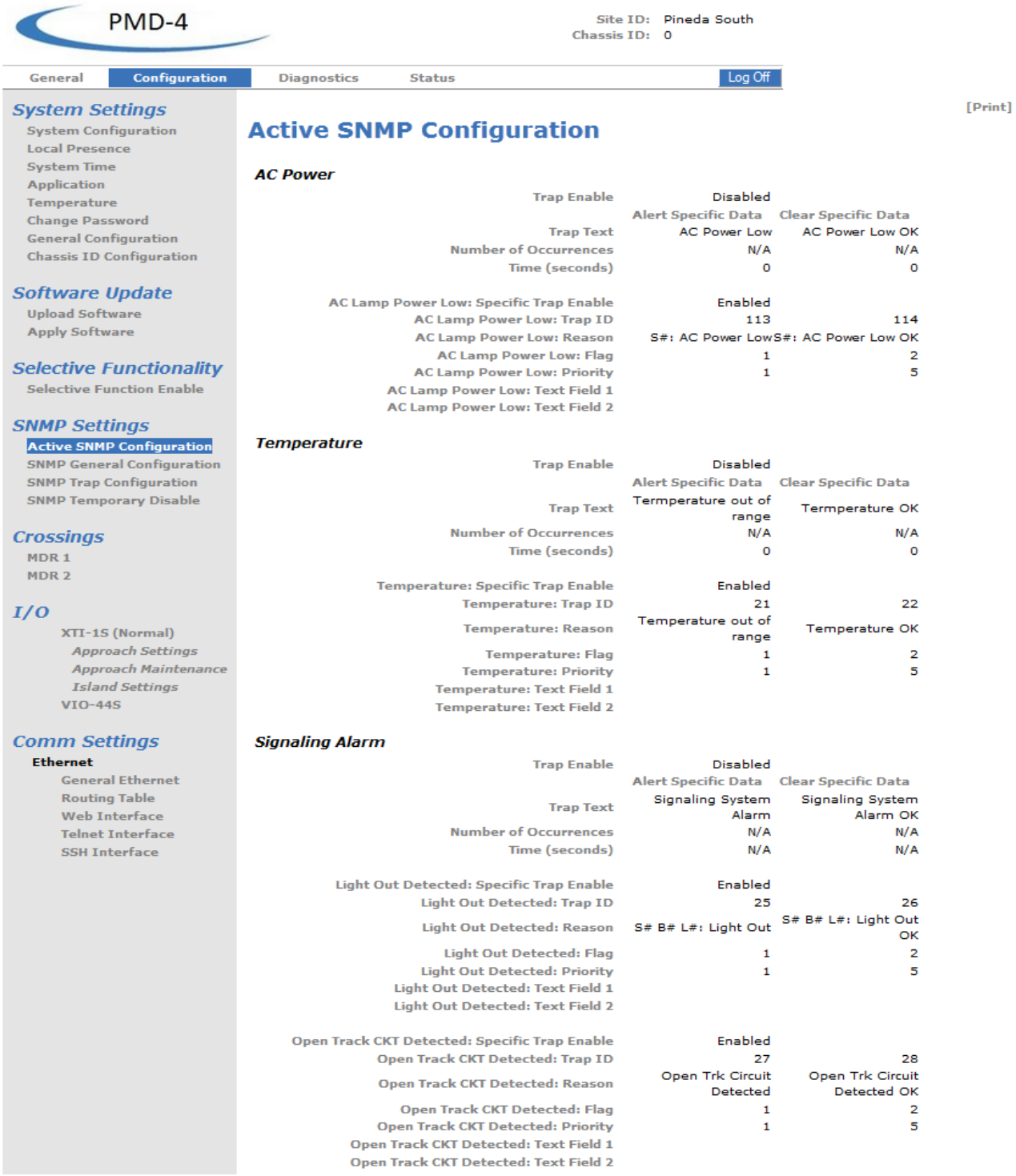
PMD-4
Site ID: Pineda South
Chassis ID: 0
General
Configuration
Diagnostics
Status
Log Off
[Print]
System Settings
System Configuration
Local Presence
System Time
Application
Temperature
Change Password
General Configuration
Chassis ID Configuration
Software Update
Upload Software
Apply Software
Selective Functionality
Selective Function Enable
SNMP Settings
Active SNMP Configuration
SNMP General Configuration
SNMP Trap Configuration
SNMP Temporary Disable
Crossings
MDR 1
MDR 2
I/O
XTI-1S (Normal)
Approach Settings
Approach Maintenance
Island Settings
VIO-44S
Comm Settings
Ethernet
General Ethernet
Routing Table
Web Interface
Telnet Interface
SSH Interface
Active SNMP Configuration
AC Power
Trap Enable: Disabled
Alert Specific Data / Clear Specific Data
Trap Text: AC Power Low / AC Power Low OK
Number of Occurrences: N/A / N/A
Time (seconds): 0 / 0
AC Lamp Power Low: Specific Trap Enable: Enabled
AC Lamp Power Low: Trap ID: 113 / 114
AC Lamp Power Low: Reason: S#: AC Power Low / S#: AC Power Low OK
AC Lamp Power Low: Flag: 1 / 2
AC Lamp Power Low: Priority: 1 / 5
AC Lamp Power Low: Text Field 1
AC Lamp Power Low: Text Field 2
Temperature
Trap Enable: Disabled
Alert Specific Data / Clear Specific Data
Trap Text: Termperature out of range / Termperature OK
Number of Occurrences: N/A / N/A
Time (seconds): 0 / 0
Temperature: Specific Trap Enable: Enabled
Temperature: Trap ID: 21 / 22
Temperature: Reason: Temperature out of range / Temperature OK
Temperature: Flag: 1 / 2
Temperature: Priority: 1 / 5
Temperature: Text Field 1
Temperature: Text Field 2
Signaling Alarm
Trap Enable: Disabled
Alert Specific Data / Clear Specific Data
Trap Text: Signaling System Alarm / Signaling System Alarm OK
Number of Occurrences: N/A / N/A
Time (seconds): N/A / N/A
Light Out Detected: Specific Trap Enable: Enabled
Light Out Detected: Trap ID: 25 / 26
Light Out Detected: Reason: S# B# L#: Light Out / S# B# L#: Light Out OK
Light Out Detected: Flag: 1 / 2
Light Out Detected: Priority: 1 / 5
Light Out Detected: Text Field 1
Light Out Detected: Text Field 2
Open Track CKT Detected: Specific Trap Enable: Enabled
Open Track CKT Detected: Trap ID: 27 / 28
Open Track CKT Detected: Reason: Open Trk Circuit Detected / Open Trk Circuit Detected OK
Open Track CKT Detected: Flag: 1 / 2
Open Track CKT Detected: Priority: 1 / 5
Open Track CKT Detected: Text Field 1
Open Track CKT Detected: Text Field 2

Figure 7-34 - Active SNMP Configuration (1) (Cont. on next page)

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System Health

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	System Health	System Health OK
Number of Occurrences	N/A	N/A
Time (seconds)	N/A	N/A
Module Health: Specific Trap Enable	Enabled	
Module Health: Trap ID	29	30
Module Health: Reason	[Module] #: [Failure Message]	[Module] #: [Failure Message] OK
Module Health: Flag	1	2
Module Health: Priority	1	5
Module Health: Text Field 1		
Module Health: Text Field 2		
Module Removed: Specific Trap Enable	Enabled	
Module Removed: Trap ID	31	32
Module Removed: Reason	IXC S# Removed	IXC S# Removed OK
Module Removed: Flag	1	2
Module Removed: Priority	1	5
Module Removed: Text Field 1		
Module Removed: Text Field 2		
Module Not Installed: Specific Trap Enable	Enabled	
Module Not Installed: Trap ID	33	34
Module Not Installed: Reason	[VLD S#:/XCI] Not Installed	[VLD S#:/XCI] Not Installed OK
Module Not Installed: Flag	1	2
Module Not Installed: Priority	1	5
Module Not Installed: Text Field 1		
Module Not Installed: Text Field 2		

Communications Link

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	Communications link state	Communications link OK
Number of Occurrences	0	N/A
Time (seconds)	0	N/A
Class D Message Error: Specific Trap Enable	Enabled	
Class D Message Error: Trap ID	35	36
Class D Message Error: Reason	Class D port error	Class D port OK
Class D Message Error: Flag	1	2
Class D Message Error: Priority	1	5
Class D Message Error: Text Field 1		
Class D Message Error: Text Field 2		
Class D Server Changed: Specific Trap Enable	Enabled	
Class D Server Changed: Trap ID	109	N/A
Class D Server Changed: Reason	Class D Server changed	N/A
Class D Server Changed: Flag	1	N/A
Class D Server Changed: Priority	1	N/A
Class D Server Changed: Text Field 1		N/A
Class D Server Changed: Text Field 2		N/A
Vital Remote Link Error: Specific Trap Enable	Enabled	
Vital Remote Link Error: Trap ID	37	38
Vital Remote Link Error: Reason	Remote Link Error	Remote Link OK
Vital Remote Link Error: Flag	1	2
Vital Remote Link Error: Priority	1	5
Vital Remote Link Error: Text Field 1		
Vital Remote Link Error: Text Field 2		
LCP Link Down: Specific Trap Enable	Enabled	
LCP Link Down: Trap ID	39	40
LCP Link Down: Reason	LCP Link Down	LCP Link Down OK
LCP Link Down: Flag	1	2
LCP Link Down: Priority	1	5
LCP Link Down: Text Field 1		
LCP Link Down: Text Field 2		

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Figure 7-35 - Active SNMP Configuration (2) (Cont. on next)

Office Code Fail: Specific Trap Enable	Enabled	
Office Code Fail: Trap ID	43	44
Office Code Fail: Reason	Office Code Fail	Office Code Fail OK
Office Code Fail: Flag	1	2
Office Code Fail: Priority	1	5
Office Code Fail: Text Field 1		
Office Code Fail: Text Field 2		
Office Link Fail: Specific Trap Enable	Enabled	
Office Link Fail: Trap ID	45	46
Office Link Fail: Reason	Office Link Fail	Office Link Fail OK
Office Link Fail: Flag	1	2
Office Link Fail: Priority	1	5
Office Link Fail: Text Field 1		
Office Link Fail: Text Field 2		
Dup MAC Detected: Specific Trap Enable	Enabled	
Dup MAC Detected: Trap ID	47	48
Dup MAC Detected: Reason	Duplicate MAC	Duplicate MAC OK
Dup MAC Detected: Flag	1	2
Dup MAC Detected: Priority	1	5
Dup MAC Detected: Text Field 1		
Dup MAC Detected: Text Field 2		
Dup IP Address Detected: Specific Trap Enable	Enabled	
Dup IP Address Detected: Trap ID	49	50
Dup IP Address Detected: Reason	Duplicate IP Port #	Duplicate IP Port # OK
Dup IP Address Detected: Flag	1	2
Dup IP Address Detected: Priority	1	5
Dup IP Address Detected: Text Field 1		
Dup IP Address Detected: Text Field 2		

Crossing Alarm

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	Crossing Alarm	Crossing OK
Number of Occurrences	N/A	N/A
Time (seconds)	N/A	N/A
Crossing High Signal Fault: Specific Trap Enable	Enabled	
Crossing High Signal Fault: Trap ID	51	52
Crossing High Signal Fault: Reason	XTI S# A#: High Sgnl	XTI S# A#: High Sgnl OK
Crossing High Signal Fault: Flag	1	2
Crossing High Signal Fault: Priority	1	5
Crossing High Signal Fault: Text Field 1		
Crossing High Signal Fault: Text Field 2		
Crossing Low Phase Fault: Specific Trap Enable	Enabled	
Crossing Low Phase Fault: Trap ID	53	54
Crossing Low Phase Fault: Reason	XTI S# A#: Low Phase	XTI S# A#: Low Phase OK
Crossing Low Phase Fault: Flag	1	2
Crossing Low Phase Fault: Priority	1	5
Crossing Low Phase Fault: Text Field 1		
Crossing Low Phase Fault: Text Field 2		
Transmitter Check Alarm: Specific Trap Enable	Enabled	
Transmitter Check Alarm: Trap ID	55	56
Transmitter Check Alarm: Reason	XTI S# A#: Xmit Chk	XTI S# A#: Xmit Chk OK
Transmitter Check Alarm: Flag	1	2
Transmitter Check Alarm: Priority	1	5
Transmitter Check Alarm: Text Field 1		
Transmitter Check Alarm: Text Field 2		
Xing Track CKT Cal Required: Specific Trap Enable	Enabled	
Xing Track CKT Cal Required: Trap ID	57	58
Xing Track CKT Cal Required: Reason	XTI S# A#: Cal Req	XTI S# A#: Cal Req OK
Xing Track CKT Cal Required: Flag	1	2
Xing Track CKT Cal Required: Priority	1	5
Xing Track CKT Cal Required: Text Field 1		
Xing Track CKT Cal Required: Text Field 2		
Xing Params Defaulted: Specific Trap Enable	Enabled	
Xing Params Defaulted: Trap ID	59	60
Xing Params Defaulted: Reason	XTI S#: DfltAll Parm	XTI S#: DfltAll Parm OK
Xing Params Defaulted: Flag	1	2
Xing Params Defaulted: Priority	1	5
Xing Params Defaulted: Text Field 1		
Xing Params Defaulted: Text Field 2		
Decreasing Phase Fault: Specific Trap Enable	Enabled	
Decreasing Phase Fault: Trap ID	61	62
Decreasing Phase Fault: Reason	XTI S# A#: Dec Phase	XTI S# A#: Dec Phase OK
Decreasing Phase Fault: Flag	1	2
Decreasing Phase Fault: Priority	1	5
Decreasing Phase Fault: Text Field 1		
Decreasing Phase Fault: Text Field 2		

Figure 7-36- Active SNMP Configuration (3) (Cont. on next page)

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Approach Release Fault: Specific Trap Enable	Enabled	
Approach Release Fault: Trap ID	63	64
Approach Release Fault: Reason	XTI S# A#: Appr Rel	XTI S# A#: Appr Rel OK
Approach Release Fault: Flag	1	2
Approach Release Fault: Priority	1	5
Approach Release Fault: Text Field 1		
Approach Release Fault: Text Field 2		
False Shunt Fault: Specific Trap Enable	Enabled	
False Shunt Fault: Trap ID	65	66
False Shunt Fault: Reason	XTI S# A#: Fals Shnt	XTI S# A#: Fals Shnt OK
False Shunt Fault: Flag	1	2
False Shunt Fault: Priority	1	5
False Shunt Fault: Text Field 1		
False Shunt Fault: Text Field 2		

Configuration Change

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	Configuration Change	N/A
Number of Occurrences	N/A	N/A
Time (seconds)	N/A	N/A
Vital Config Change: Specific Trap Enable	Enabled	
Vital Config Change: Trap ID	67	N/A
Vital Config Change: Reason	Vital Config Param Changed	N/A
Vital Config Change: Flag	1	N/A
Vital Config Change: Priority	1	N/A
Vital Config Change: Text Field 1		N/A
Vital Config Change: Text Field 2		N/A
Non-Vital Config Change: Specific Trap Enable	Enabled	
Non-Vital Config Change: Trap ID	69	N/A
Non-Vital Config Change: Reason	Non-Vital Config Param Changed	N/A
Non-Vital Config Change: Flag	1	N/A
Non-Vital Config Change: Priority	1	N/A
Non-Vital Config Change: Text Field 1		N/A
Non-Vital Config Change: Text Field 2		N/A

WIU Health

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	WIU Health	WIU Health OK
Number of Occurrences	N/A	N/A
Time (seconds)	0	0
PTC Disabled: Specific Trap Enable	Enabled	
PTC Disabled: Trap ID	71	72
PTC Disabled: Reason	PTC Disabled	PTC Enabled
PTC Disabled: Flag	1	2
PTC Disabled: Priority	1	5
PTC Disabled: Text Field 1		
PTC Disabled: Text Field 2		
Processor Reset: Specific Trap Enable	Enabled	
Processor Reset: Trap ID	73	74
Processor Reset: Reason	Processor C Reset	Processor C Reset clear
Processor Reset: Flag	1	2
Processor Reset: Priority	1	5
Processor Reset: Text Field 1		
Processor Reset: Text Field 2		

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Figure 7-37 - Active SNMP Configuration (4) (Cont. on next page)

Processor Reset: Specific Trap Enable	Enabled	
Processor Reset: Trap ID	73	74
Processor Reset: Reason	Processor C Reset	Processor C Reset clear
Processor Reset: Flag	1	2
Processor Reset: Priority	1	5
Processor Reset: Text Field 1		
Processor Reset: Text Field 2		
Program Flash Error: Specific Trap Enable	Enabled	
Program Flash Error: Trap ID	75	N/A
Program Flash Error: Reason	Program Flash Fault	N/A
Program Flash Error: Flag	1	N/A
Program Flash Error: Priority	1	N/A
Program Flash Error: Text Field 1		N/A
Program Flash Error: Text Field 2		N/A
Log Flash Error: Specific Trap Enable	Enabled	
Log Flash Error: Trap ID	77	N/A
Log Flash Error: Reason	Log Flash Fault	N/A
Log Flash Error: Flag	1	N/A
Log Flash Error: Priority	1	N/A
Log Flash Error: Text Field 1		N/A
Log Flash Error: Text Field 2		N/A

HMAC Rejection

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	HMAC rejection	N/A
Number of Occurrences	0	N/A
Time (seconds)	0	N/A
HMAC Rejection: Specific Trap Enable	Enabled	
HMAC Rejection: Trap ID	81	N/A
HMAC Rejection: Reason	HMAC rejection	N/A
HMAC Rejection: Flag	1	N/A
HMAC Rejection: Priority	1	N/A
HMAC Rejection: Text Field 1		N/A
HMAC Rejection: Text Field 2		N/A

EMP CRC Rejection

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	EMP CRC rejection	N/A
Number of Occurrences	0	N/A
Time (seconds)	0	N/A
EMP CRC Rejection: Specific Trap Enable	Enabled	
EMP CRC Rejection: Trap ID	83	N/A
EMP CRC Rejection: Reason	EMP CRC rejection	N/A
EMP CRC Rejection: Flag	1	N/A
EMP CRC Rejection: Priority	1	N/A
EMP CRC Rejection: Text Field 1		N/A
EMP CRC Rejection: Text Field 2		N/A

HMAC Key Change

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	HMAC key change	N/A
Number of Occurrences	0	N/A
Time (seconds)	N/A	N/A
HMAC Key Change: Specific Trap Enable	Enabled	
HMAC Key Change: Trap ID	85	N/A
HMAC Key Change: Reason	HMAC key change	N/A
HMAC Key Change: Flag	1	N/A
HMAC Key Change: Priority	1	N/A

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Figure 7-38 - Active SNMP Configuration (5) (Cont. on next page)

HMAC Key Change: Text Field 1		N/A
HMAC Key Change: Text Field 2		N/A

Time Synchronization Error

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	Time sync error	Time sync error clear
Number of Occurrences	N/A	N/A
Time (seconds)	0	N/A
Time Sync Expired: Specific Trap Enable	Enabled	
Time Sync Expired: Trap ID	87	88
Time Sync Expired: Reason	Time sync expired	Time sync OK
Time Sync Expired: Flag	1	2
Time Sync Expired: Priority	1	5
Time Sync Expired: Text Field 1		
Time Sync Expired: Text Field 2		
Time Sync Not Initialized: Specific Trap Enable	Enabled	
Time Sync Not Initialized: Trap ID	89	90
Time Sync Not Initialized: Reason	Time sync not initialized	Time sync initialized
Time Sync Not Initialized: Flag	1	2
Time Sync Not Initialized: Priority	1	5
Time Sync Not Initialized: Text Field 1		
Time Sync Not Initialized: Text Field 2		
Time Sync Delta Msg Time: Specific Trap Enable	Enabled	
Time Sync Delta Msg Time: Trap ID	91	92
Time Sync Delta Msg Time: Reason	Msg Delta Time	Msg Delta Time Clear
Time Sync Delta Msg Time: Flag	1	2
Time Sync Delta Msg Time: Priority	1	5
Time Sync Delta Msg Time: Text Field 1		
Time Sync Delta Msg Time: Text Field 2		
Time Sync Msg Window: Specific Trap Enable	Enabled	
Time Sync Msg Window: Trap ID	93	94
Time Sync Msg Window: Reason	Msg Delta Time Window	Msg Delta Time Window Clear
Time Sync Msg Window: Flag	1	2
Time Sync Msg Window: Priority	1	5
Time Sync Msg Window: Text Field 1		
Time Sync Msg Window: Text Field 2		
Time Sync LRM Time: Specific Trap Enable	Enabled	
Time Sync LRM Time: Trap ID	95	N/A
Time Sync LRM Time: Reason	LRM Msg Delta Time	N/A
Time Sync LRM Time: Flag	1	N/A
Time Sync LRM Time: Priority	1	N/A
Time Sync LRM Time: Text Field 1		N/A
Time Sync LRM Time: Text Field 2		N/A

Application Changed

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	Application changed	N/A
Number of Occurrences	N/A	N/A
Time (seconds)	N/A	N/A
Signal System App Changed: Specific Trap Enable	Enabled	
Signal System App Changed: Trap ID	97	N/A
Signal System App Changed: Reason	Signal System App changed	N/A
Signal System App Changed: Flag	1	N/A
Signal System App Changed: Priority	1	N/A
Signal System App Changed: Text Field 1		N/A
Signal System App Changed: Text Field 2		N/A

Figure 7-39 - Active SNMP Configuration (6) (Cont. on next page)

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PTC Config File Changed: Specific Trap Enable	Enabled	
PTC Config File Changed: Trap ID	101	N/A
PTC Config File Changed: Reason	PTC Config File changed	N/A
PTC Config File Changed: Flag	1	N/A
PTC Config File Changed: Priority	1	N/A
PTC Config File Changed: Text Field 1		N/A
PTC Config File Changed: Text Field 2		N/A

Invalid Wayside Device Status

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	Invalid wayside device status	N/A
Number of Occurrences	N/A	N/A
Time (seconds)	0	N/A
Invalid Wayside Device Status: Specific Trap Enable	Enabled	
Invalid Wayside Device Status: Trap ID	103	N/A
Invalid Wayside Device Status: Reason	Dev: Val:	N/A
Invalid Wayside Device Status: Flag	1	N/A
Invalid Wayside Device Status: Priority	1	N/A
Invalid Wayside Device Status: Text Field 1		N/A
Invalid Wayside Device Status: Text Field 2		N/A

WIU Heartbeat

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	WIU Heartbeat	N/A
Number of Occurrences	N/A	N/A
Time (seconds)	0	N/A
WIU Heartbeat: Specific Trap Enable	Enabled	
WIU Heartbeat: Trap ID	105	N/A
WIU Heartbeat: Reason	WIU Heartbeat	N/A
WIU Heartbeat: Flag	1	N/A
WIU Heartbeat: Priority	N/A	N/A
WIU Heartbeat: Text Field 1	N/A	N/A
WIU Heartbeat: Text Field 2	N/A	N/A

Local Presence

Trap Enable	Disabled	
	Alert Specific Data	Clear Specific Data
Trap Text	Local Presence Established	Local Presence Removed
Number of Occurrences	N/A	N/A
Time (seconds)	N/A	N/A
Local Presence: Specific Trap Enable	Enabled	
Local Presence: Trap ID	107	108
Local Presence: Reason	Local Presence Established	Local Presence Removed
Local Presence: Flag	1	2
Local Presence: Priority	1	5
Local Presence: Text Field 1		
Local Presence: Text Field 2		

Figure 7-40 - Active SNMP Configuration(7)

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Crossing Track Interface

The Configuration pages for an XTI-1S module are shown in Figures 7-46 through 7-49. The Status and Diagnostic pages are shown in Figures 7-41 and 7-47.

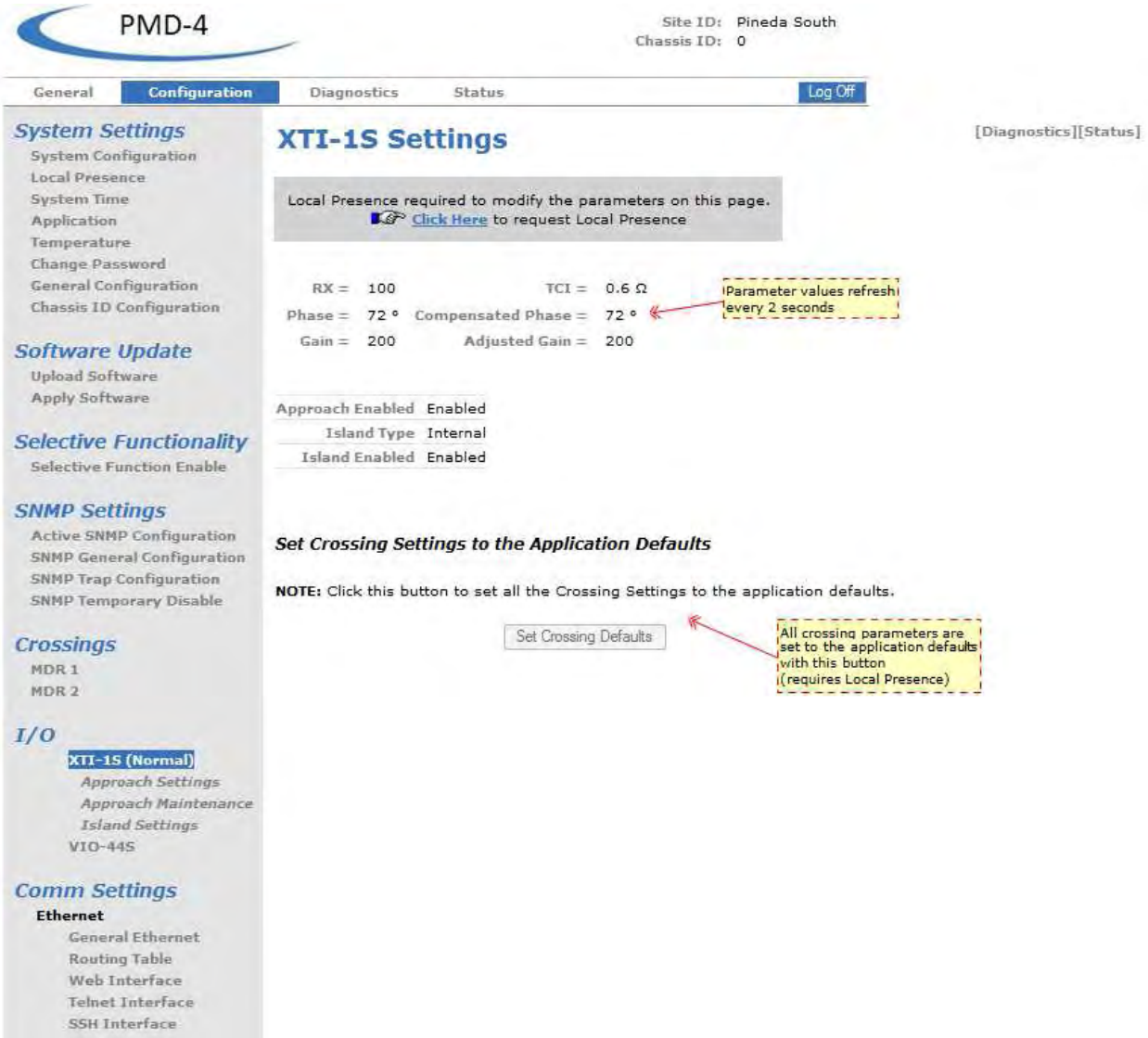

Figure 7-41, Configuration – XTI-1S

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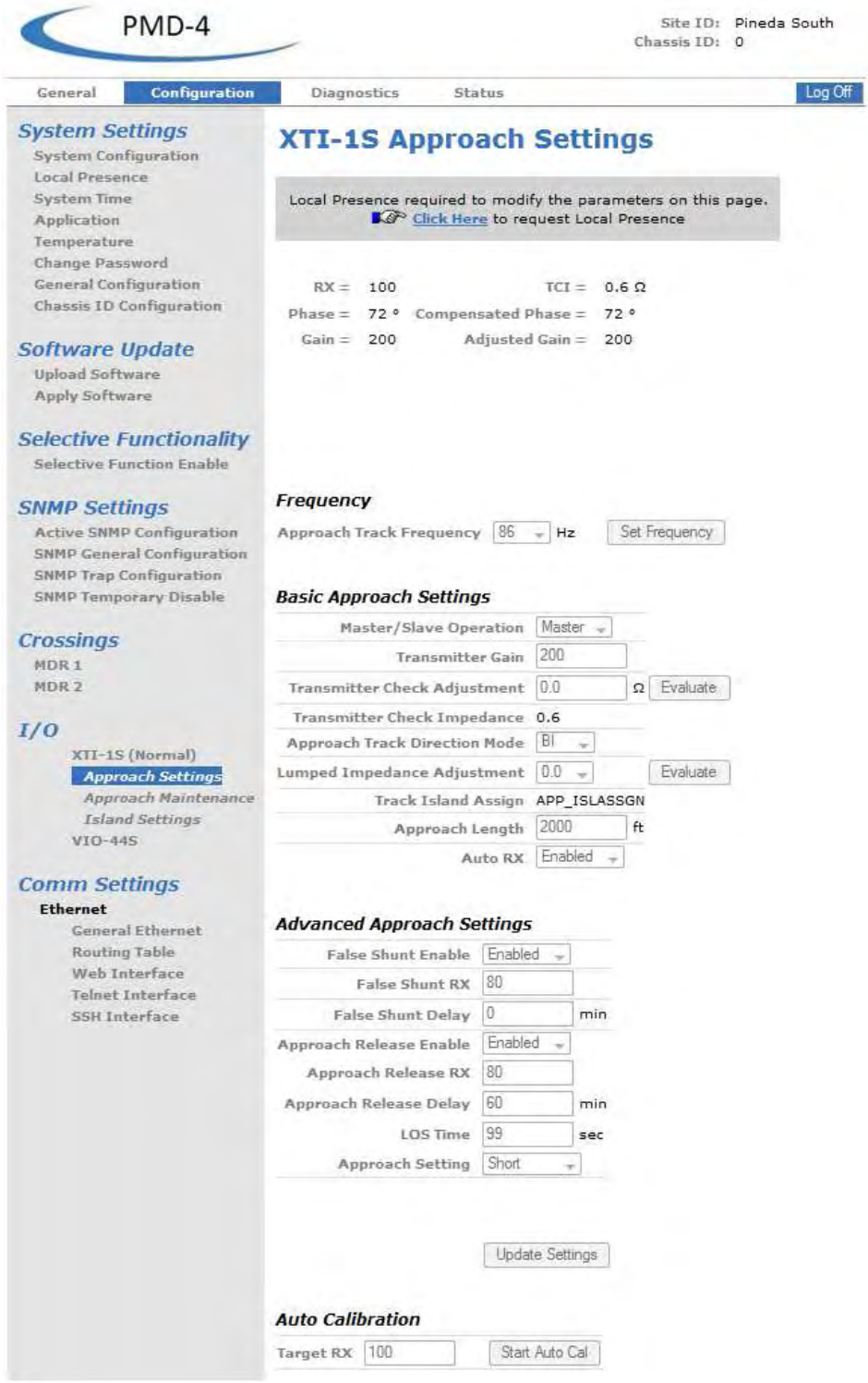

Figure 7-42, Approach Settings – XTI-1S

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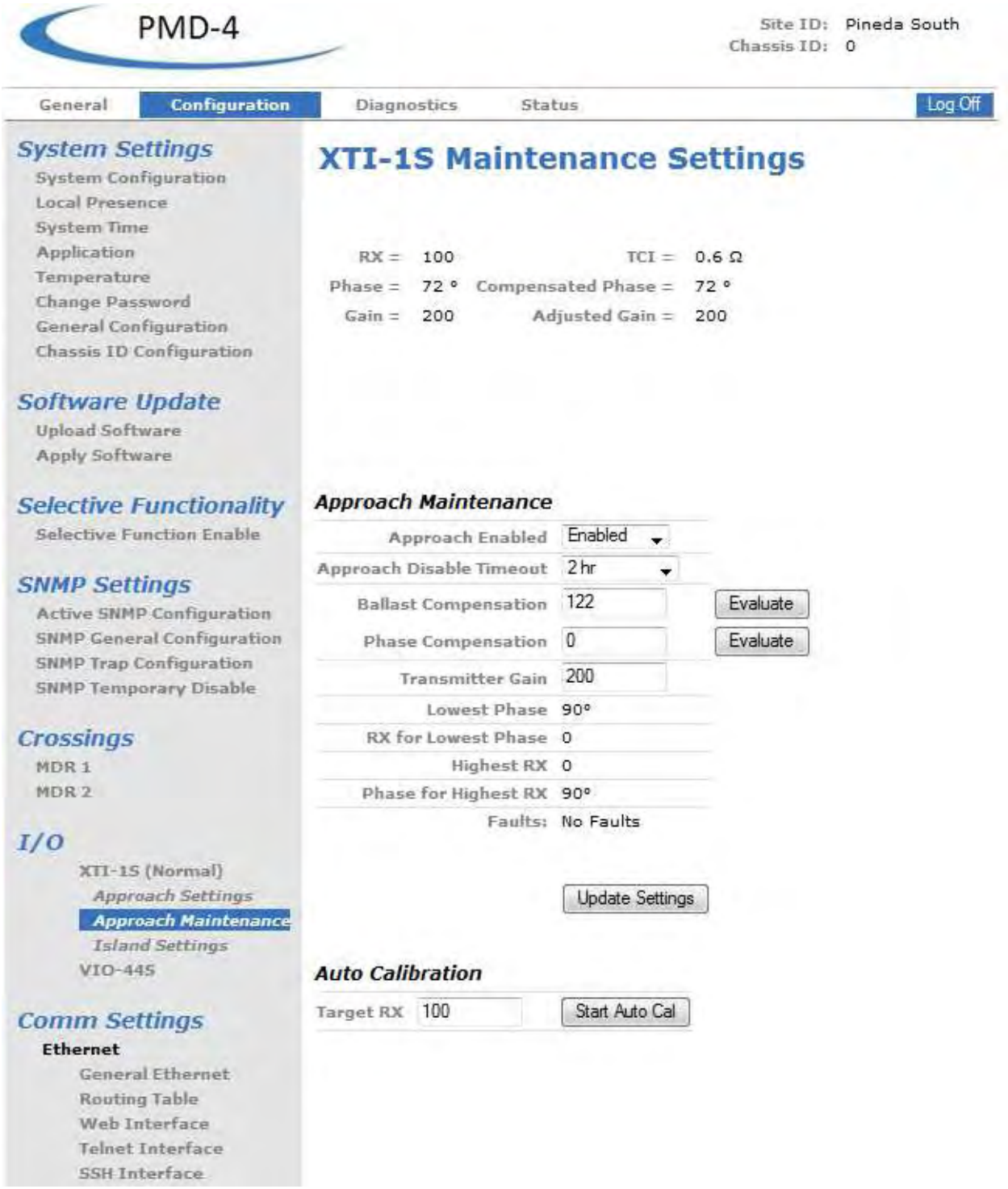

Figure 7-43, Configuration – XTI-1S Approach Maintenance

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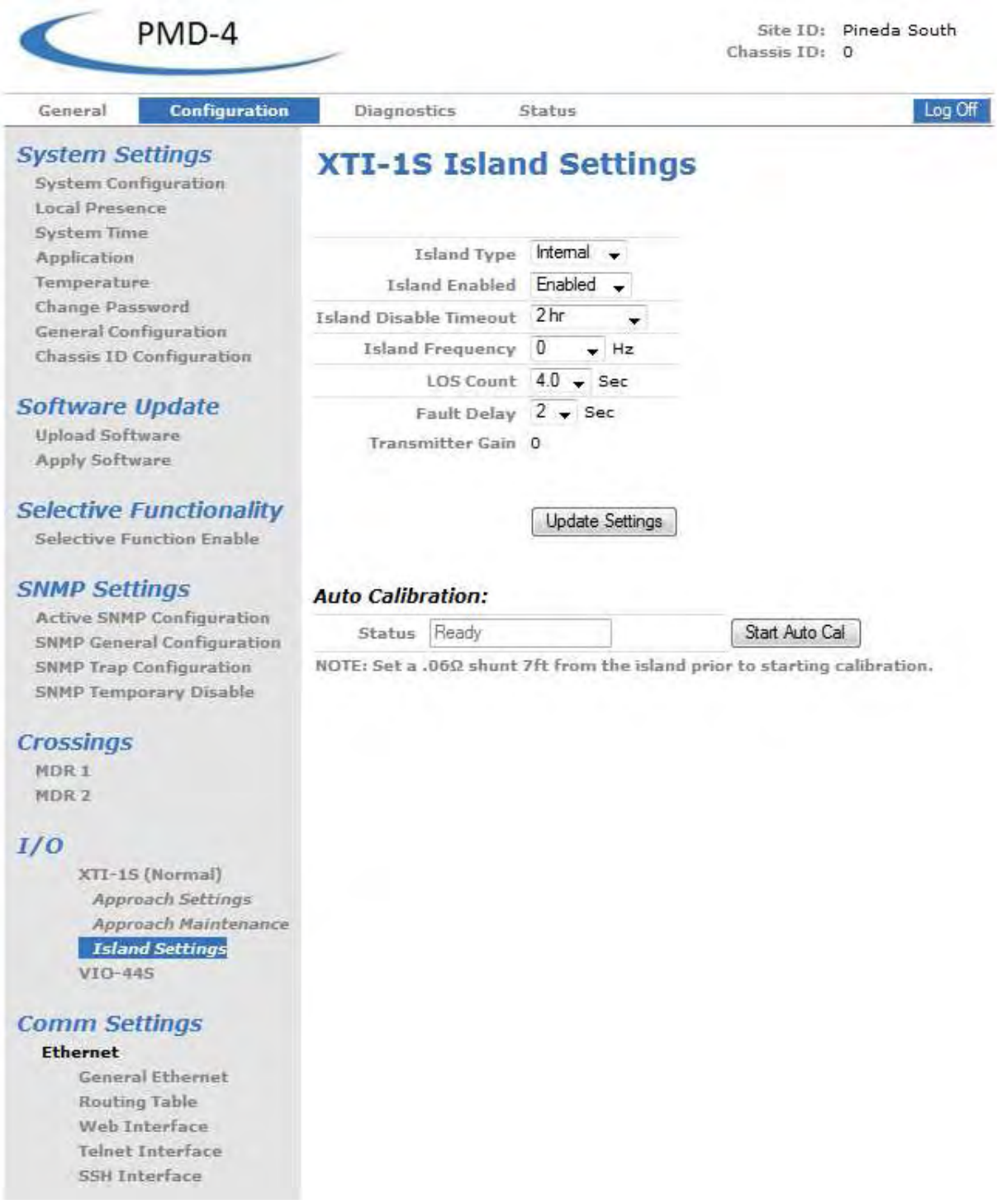

Figure 7-44, Configuration – XTI-1S Island Settings

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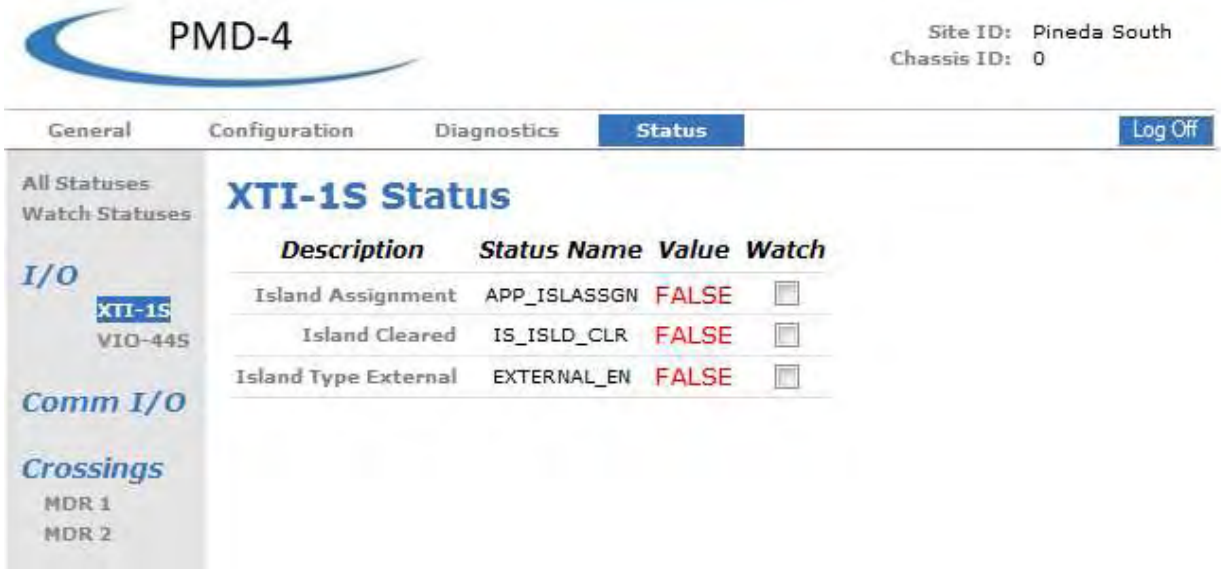

Figure 7-45, Status – XTI-1S

Figure 7-46, Diagnostics– XTI-1S

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MDR

The MDR Configuration and Status pages are shown in Figures 7-48 and 7-49. There is no Diagnostic page for MDRs.

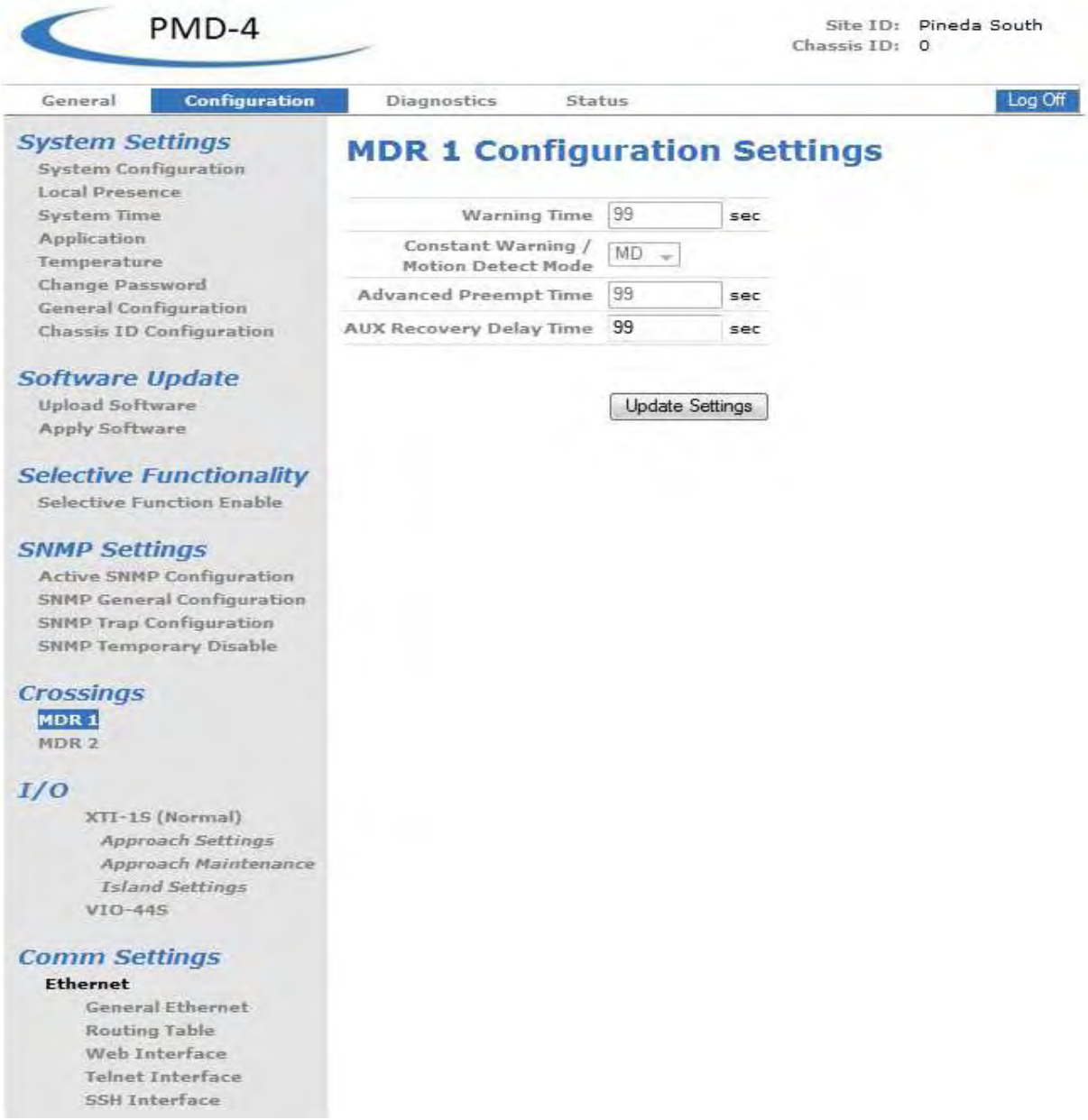

Figure 7-48, Configuration – MDR

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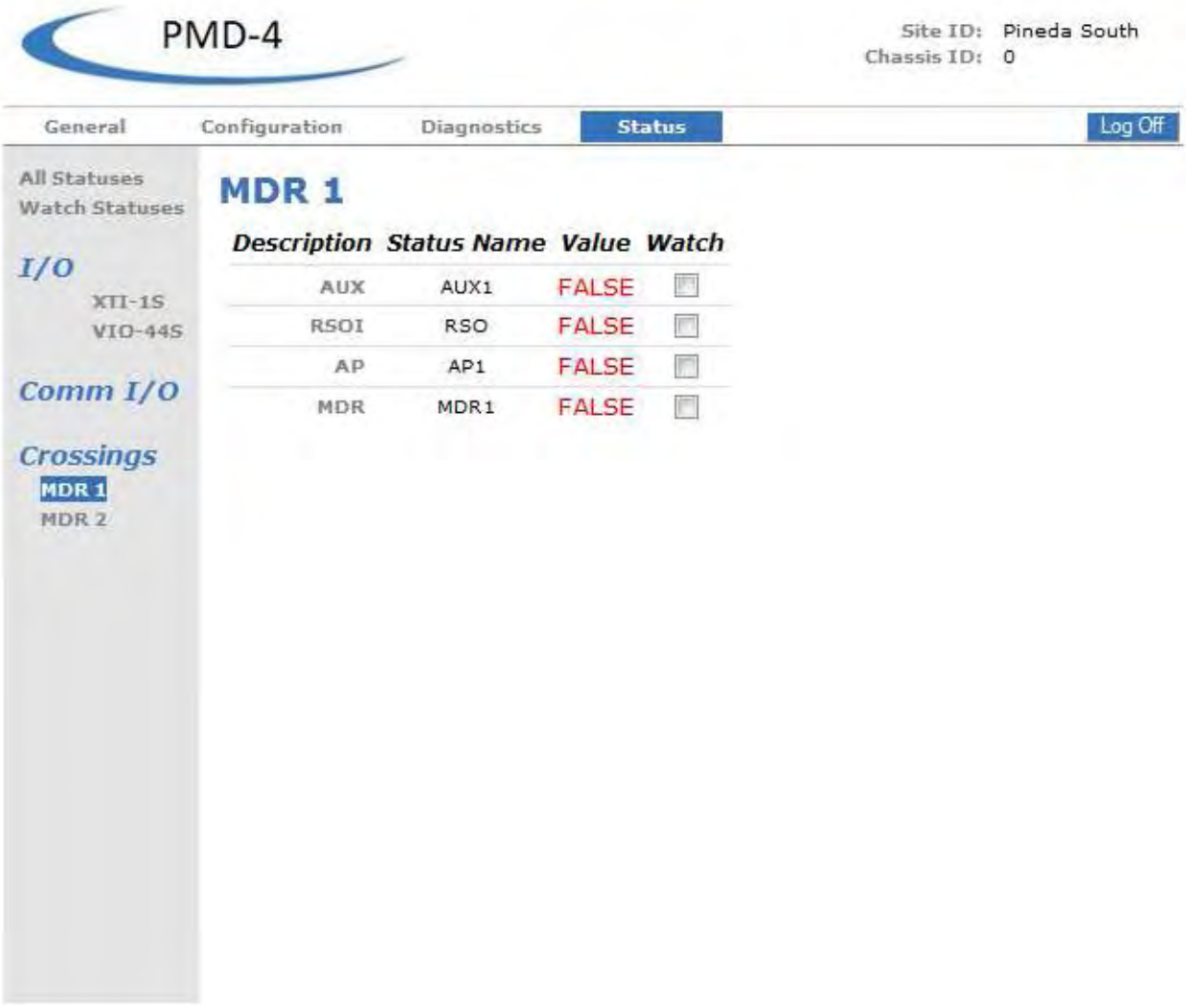

Figure 7-49, Status – MDR

Vital Inputs and Outputs

The Configuration and Status pages for the VIO-86 module are shown in Figures 7-57 and 7-58.
. The status page for the VIO-44S is shown in Figure 7-59. The VIO-44S has no configuration or diagnostic pages. The Configuration, Diagnostic, and Status pages for the VIO-44R are shown in Figures 7-60, 7-61 and 7-62. The switchover operation for the redundant banks is provided on the diagnostic page.

WARNING *For Slow Pick or Release Timers of 9 seconds or more, accuracy will be within +10%/-0%.*

For Slow Pick or Release Timers of less than 9 seconds, accuracy will be within +1 second under worst case timing conditions.

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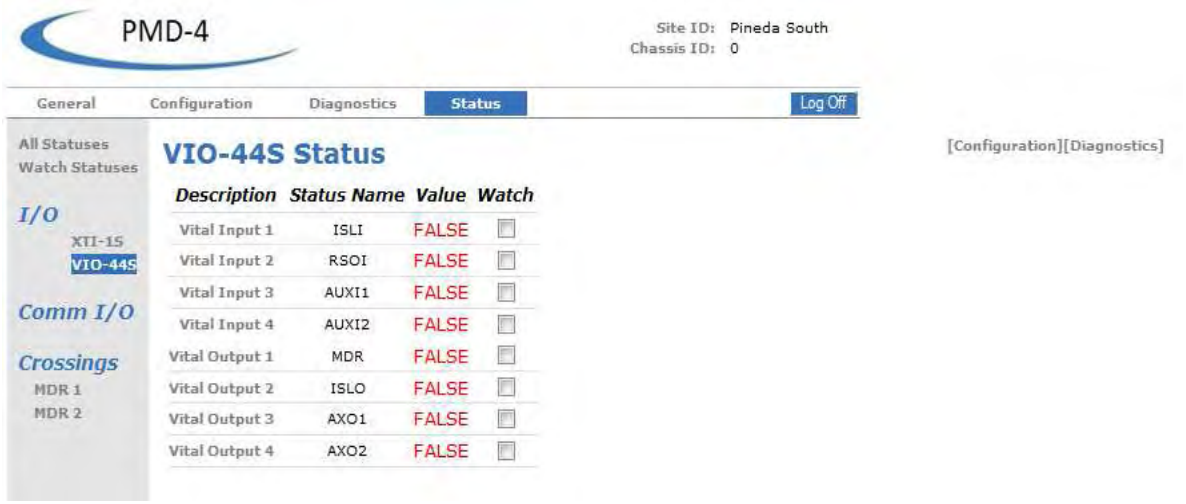

Figure 7-59, Status - VIO-44S

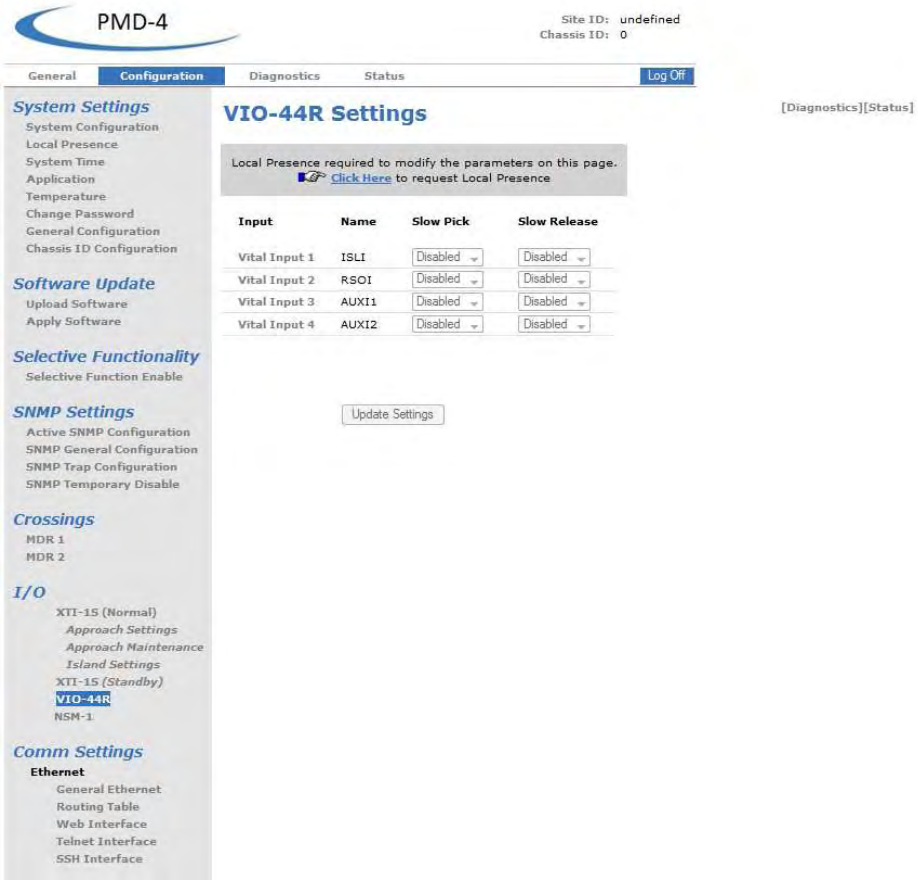

Figure 7-60, Configuration - VIO-44R

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Figure 7-61, Diagnostics - VIO-44R

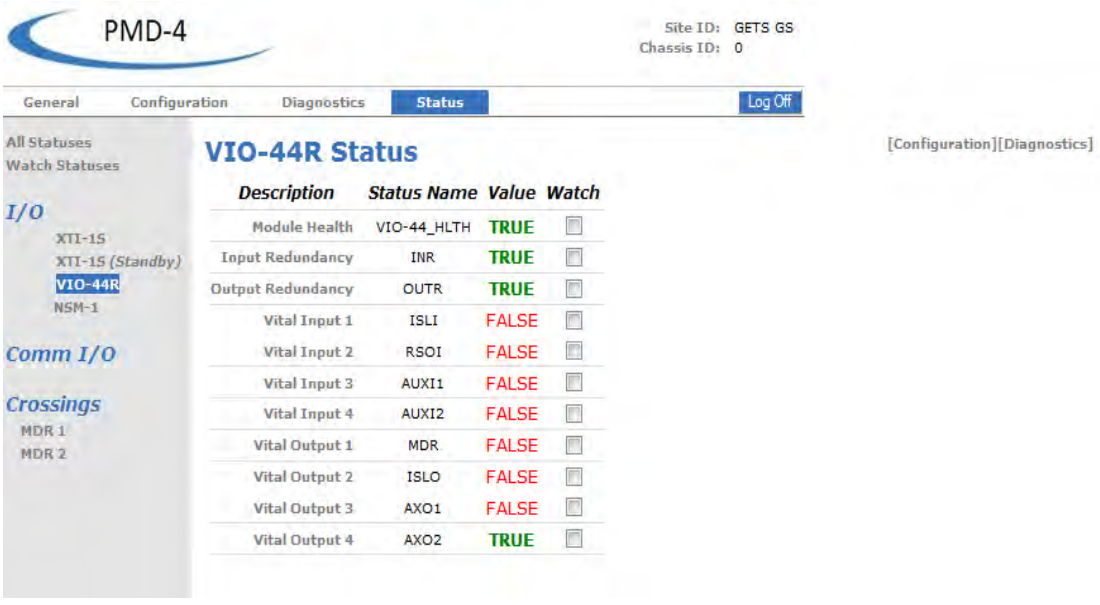

Figure 7-62, Status - VIO-44R

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Normal Standby

The Configuration and Status pages for the NSM-1 module are shown in Figures 7-63 and 7-64. There is no diagnostic page for the NSM-1

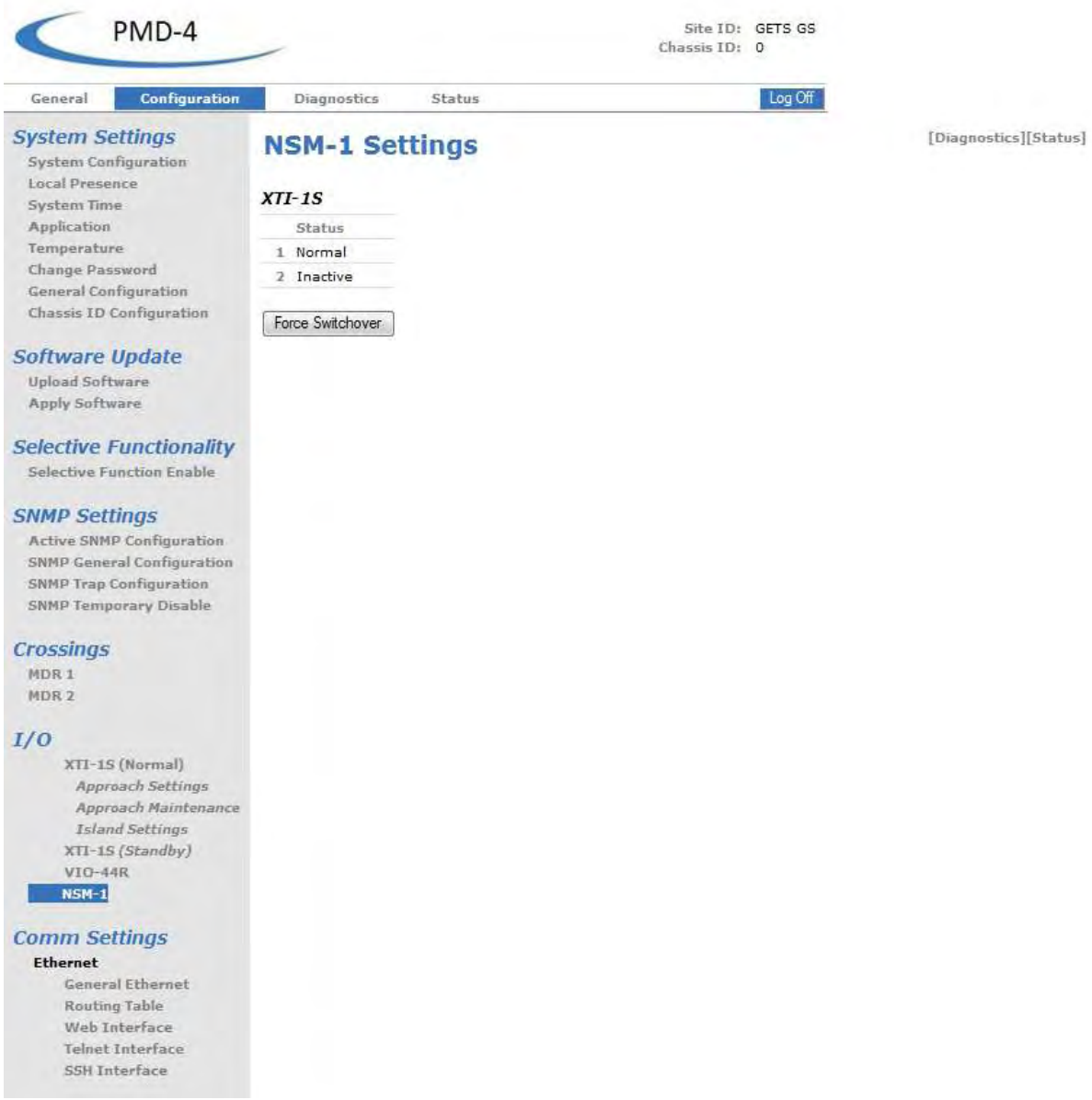

Figure 7-63, Configuration - NSM-1

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Figure 7-64, Status - NSM-1

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Communication Settings General

Remote

The General Remote Configuration page allows loading of MAC vault, deleting of the loaded MAC vault, starting and re-starting of MAC switchover, canceling of MAC switchover, viewing and updating the MMST value, and defaulting of vital and non-vital parameters. Selecting "Default Non-Vital Parameters" or "Default Vital Parameters" applies the default settings in the loaded application.

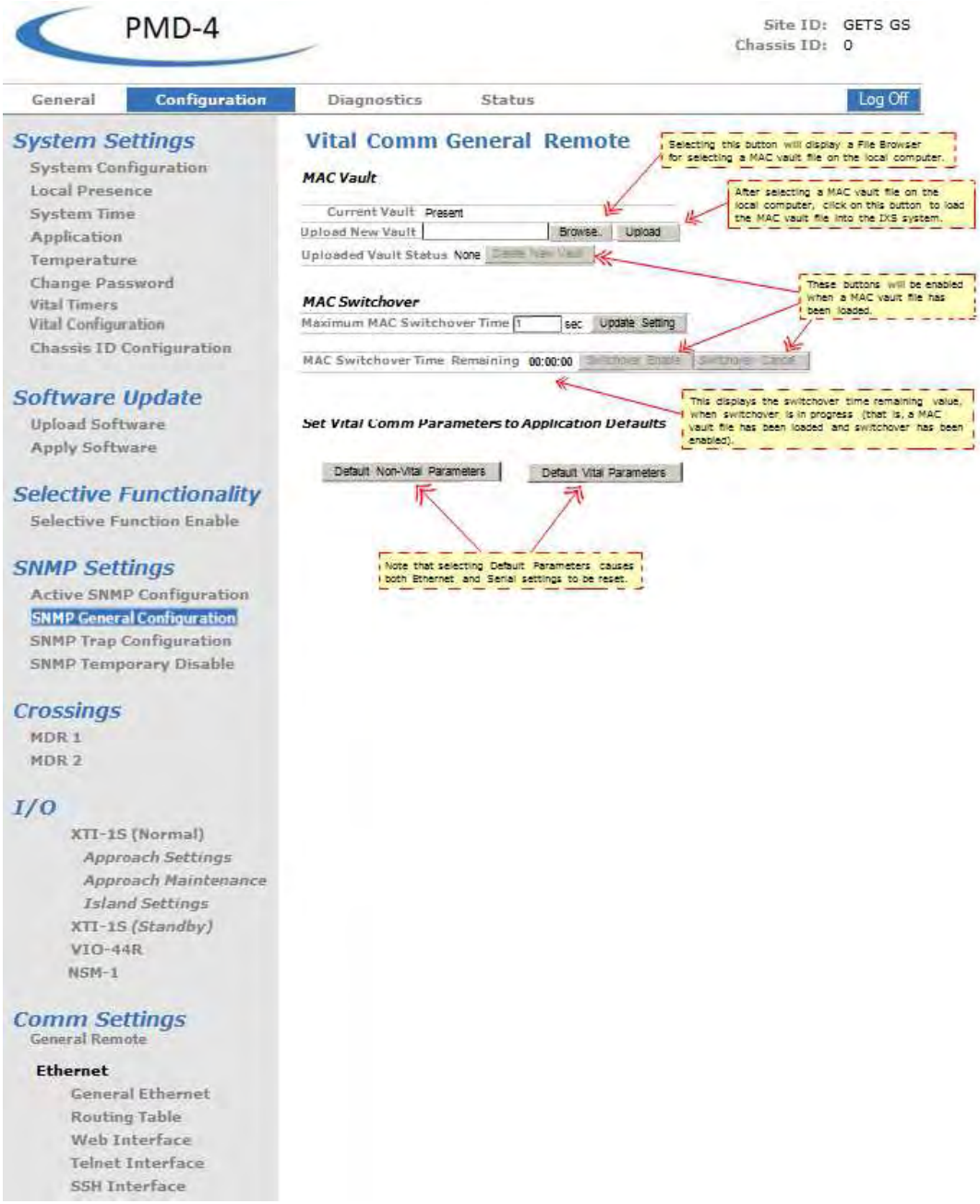

Figure 7-67, Configuration - General Remote

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General Ethernet

The General Ethernet Configuration page, shown in Figure 7-68, allows modification of the IP address, subnet mask, DHCP Server Enable/Disable, DHCP Server IP Pool Start, DHCP Server IP Pool End, DHCP Server Default Gateway for each of the two Ethernet ports along with the IP address of the Default Gateway. A Set Ethernet Defaults selection is provided to establish the settings contained in the application. When "Set Ethernet Defaults" is selected on the CDU or Web GUI, the DHCP Server Settings will be defaulted. Note that if the IP address of the Ethernet Port being used for the Web GUI session changes, the user will be logged out and will be required to log in to the new IP address. PMD-4/4R uses a DHCP address pool from the subnet of each of the two Ethernet ports. The typical case is that the two ports are on different subnets; therefore each has its own pool of IP addresses to assign.

An IP address is comprised of a Network field and a Host field. The Network field is identified by the "1s" in the subnet mask while the Host field is identified by the "0s" in the subnet mask. For example 255.255.255.0 The minimum allowable IP Pool address is the third address value from the beginning of the host field (e.g. 192.168.10.2) and the maximum allowable IP Pool address is the third address from the end value of the host field (e.g. 192.168.10.253).

The maximum PMD-4/4R DHCP IP pool range is 32 consecutive IP addresses from each of the possible subnets. Also, the x.x.x.0, x.x.x.1, x.x.x.254, and x.x.x.255 address of a subnet are not assignable as these are reserved for use by routers or other networking devices.

Additionally, a DHCP IP pool range cannot span the Ethernet port IP address. That is, if the IP address is set to 192.168.10.20 and the DHCP IP Pool Start address is set to 192.168.0.15, the DHCP IP Pool End must be 192.168.0.19.

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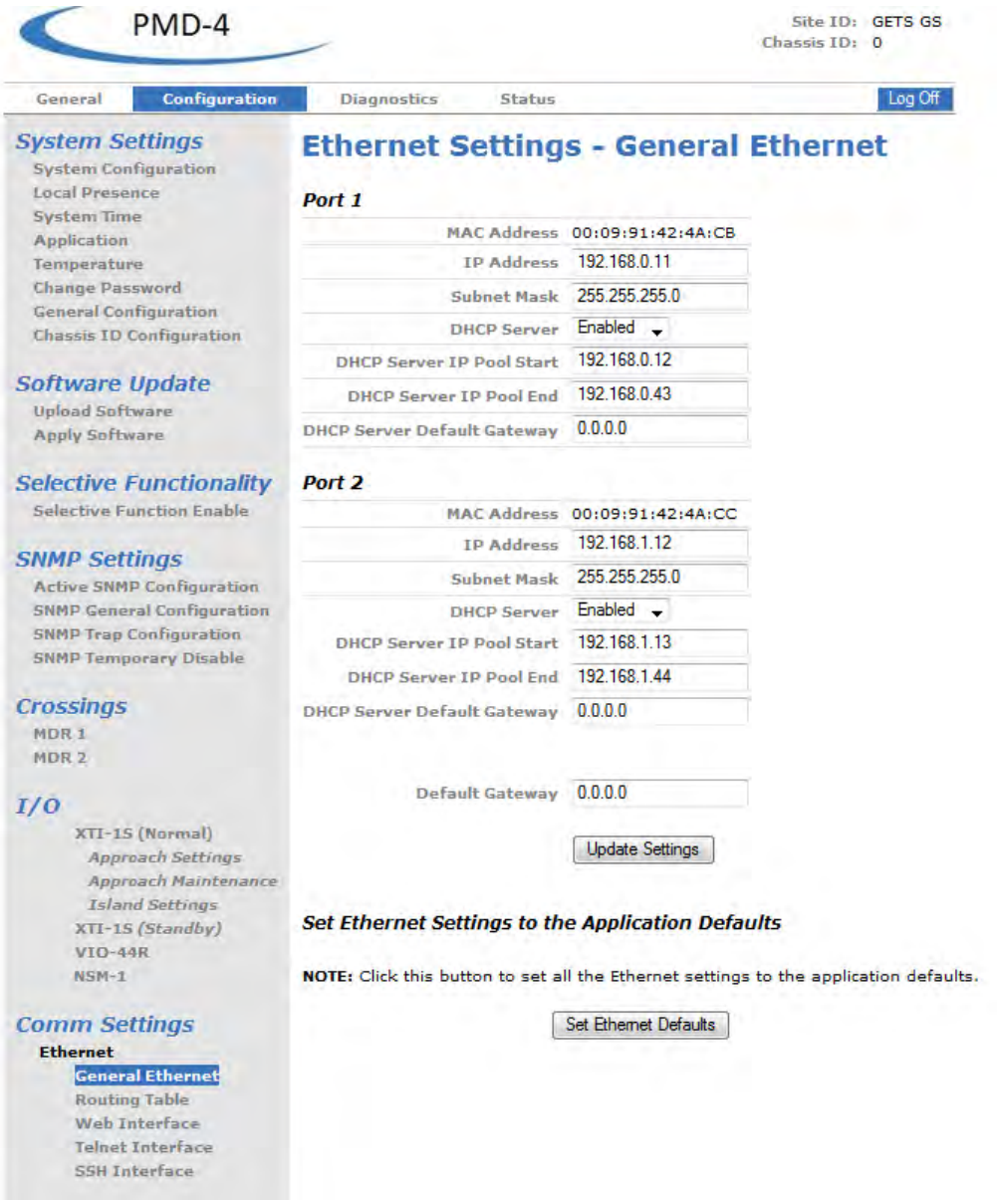

Figure 7-68, Configuration - General Ethernet

Routing Table

The Routing Table configuration page, shown in Figure 7-69, allows up to eight static route entries to be designated. To manually enter and activate a routing table entry, click the “Enabled” box, enter the IP routing information along with the physical Ethernet port to use for that entry, and select Update Settings. To remove an existing entry from the table, uncheck the “Enabled” box and select Update Settings.

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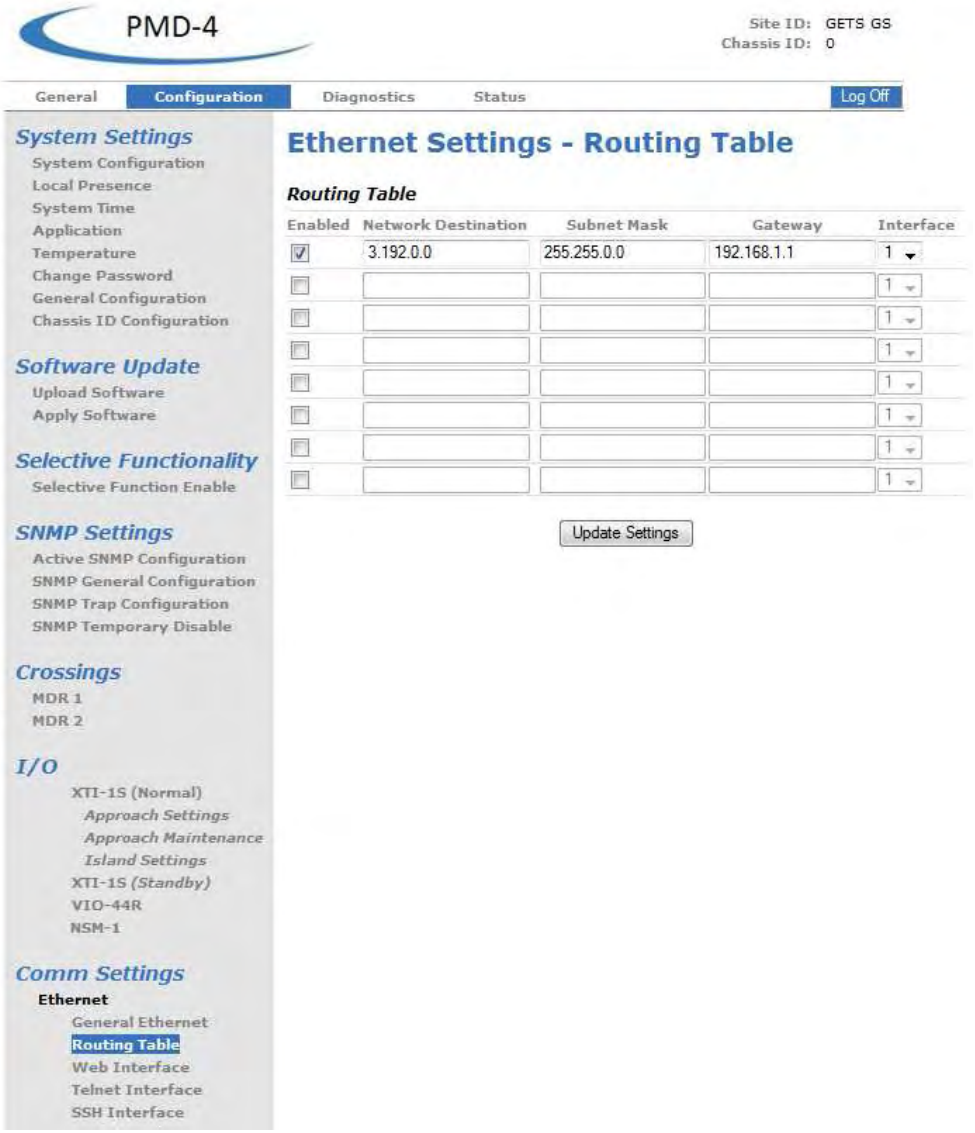

Figure 7-69, Configuration - Routing Table

Web Interface

The Web Interface configuration page, shown in Figure 7-70, provides a means to change the TCP Port number to be used for HTTP access, the Inactivity time-out (auto log out time), and the Trusted Source settings for the two Ethernet Ports.

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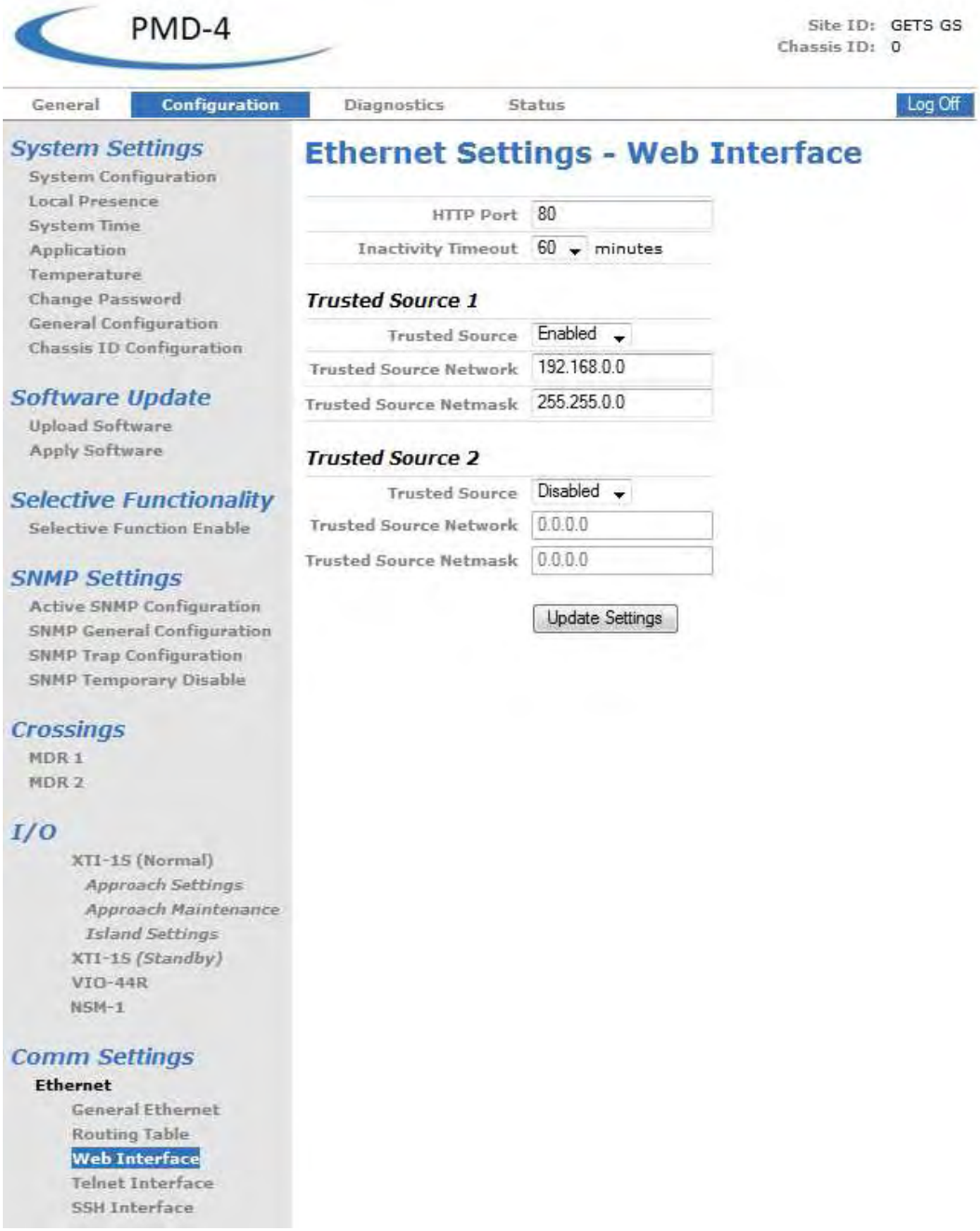

Figure 7-70, Configuration - Web Interface

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Telnet Interface

The Telnet Interface configuration page provides a means to change the Username, Password, TCP port number, Inactivity timeout, and the Trusted Source settings for the two Ethernet ports.

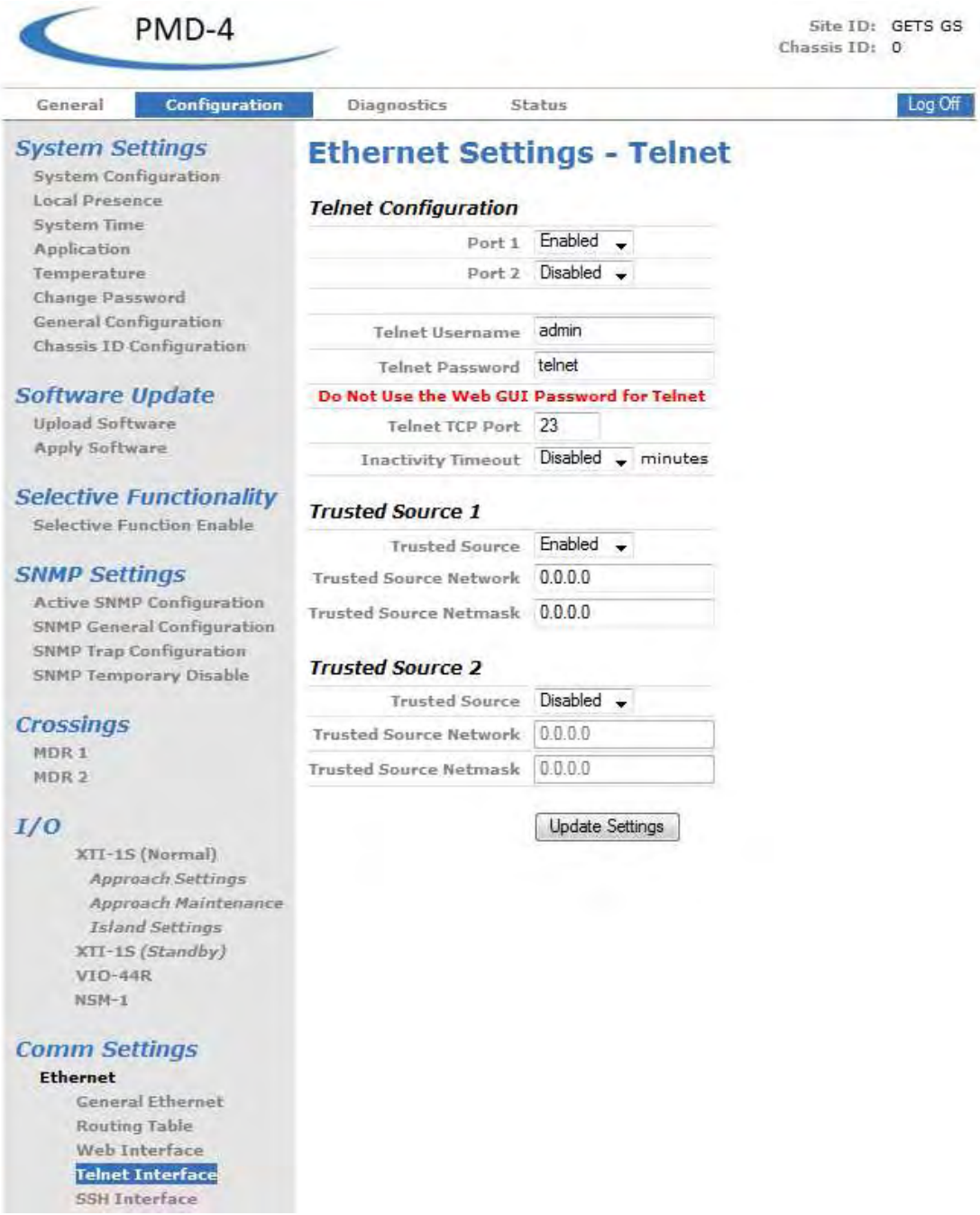

Figure 7-71, Configuration - Telnet Interface

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Ethernet Vital Remote

The Ethernet Vital Remote configuration page allows non-vital parameters of IP address, Port Number, Date/Time update and MAC enable/disable to be configured for each remote.

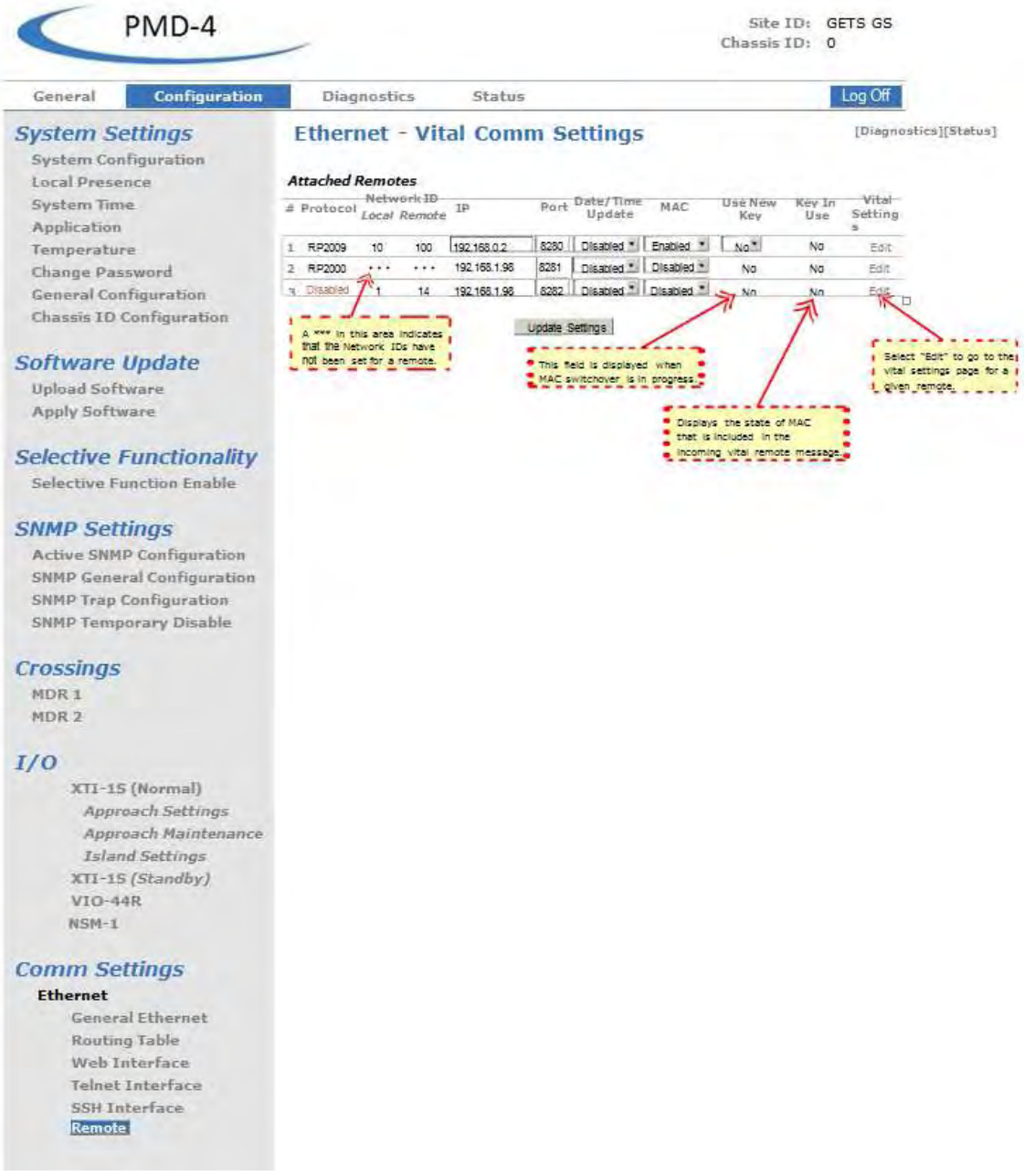

Figure 7-72, Configuration - Remote (Ethernet)

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Ethernet Vital Communication

WARNING *Railroad Configuration Management Procedures must ensure that the proper values are set for each vital remote parameter in the PMD-4/4R units. Incorrect settings may result in death or serious injury. Reference SRAC2.*

WARNING *When setting a vital remote link Local or Remote Network ID on an PMD-4/4R, use only the value supplied on the application circuit plans. If this information is not available from the application circuit plans, do not put that vital remote link into service until this is corrected. Failure to comply could result in death or serious injury. (See Appendix C for more detailed information) Reference SRAC2.*

The Ethernet Vital Communication page allows the modification of the various vital settings for a given remote device. Modifications may be fixed or may have parameter ranges defined by the application program.

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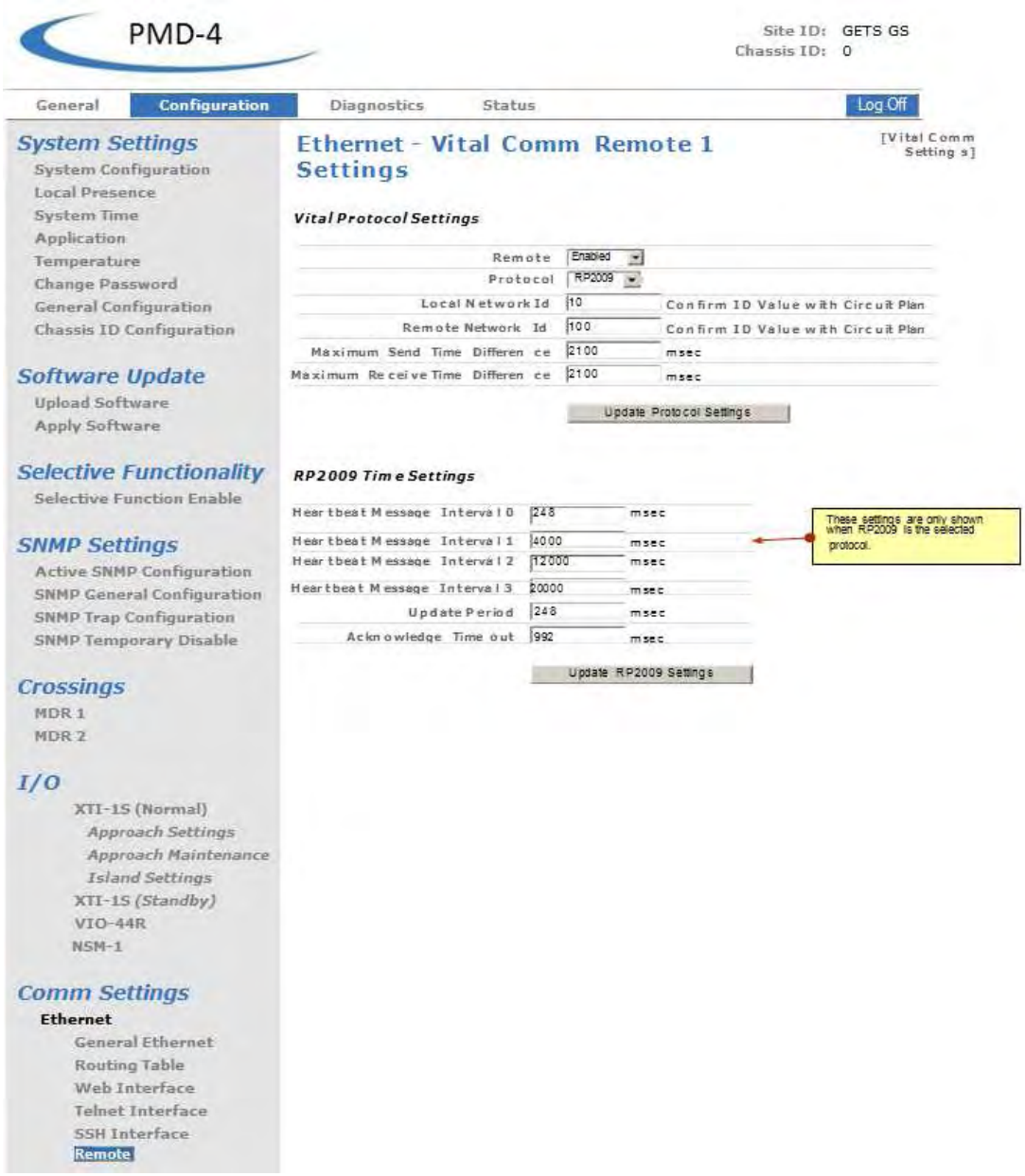

Figure 7-72a, Configuration - Vital Communication (Ethernet)

Ethernet Office

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The Ethernet Office configuration page allows the selection of the office protocol to be used on the Ethernet interface when an Ethernet Office is defined in the application program.

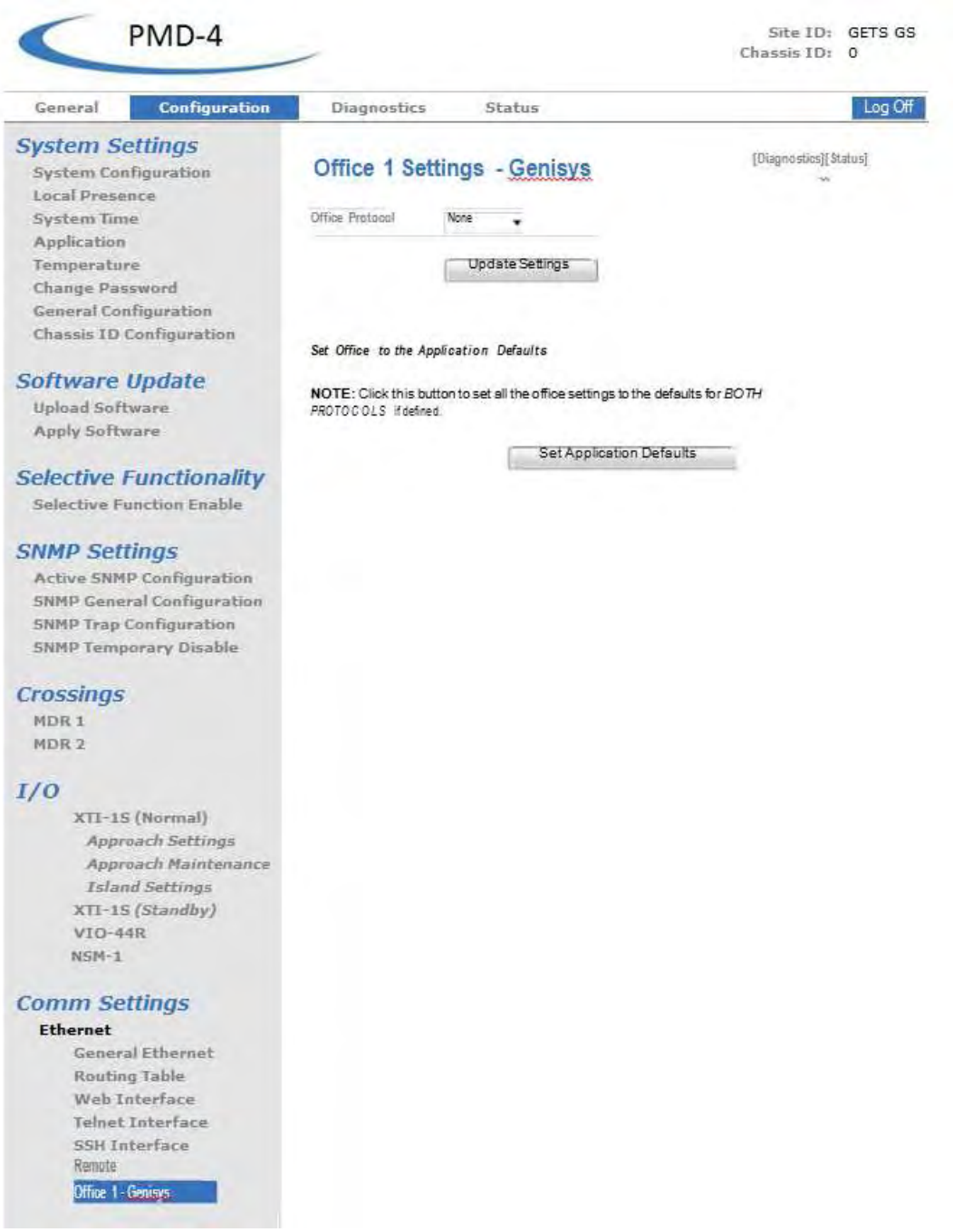

Figure 7-73, Configuration - Office (Ethernet)

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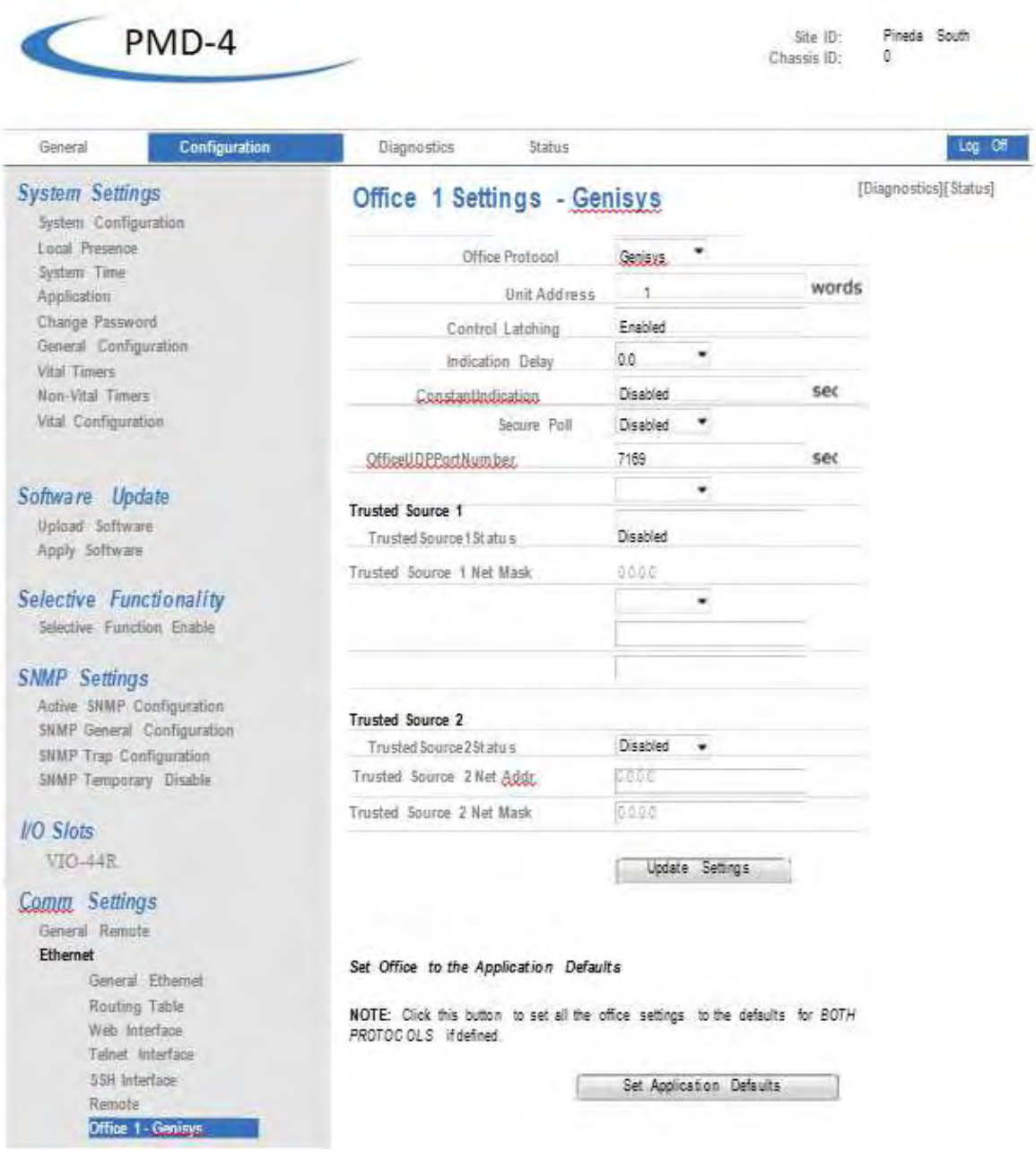

Figure 7-74, Configuration - Office (Ethernet)

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Diagnostics Main Menu

Logging

View Live Log

Items selected for live logging on the Configure Live Log page are displayed as logging events occur. When this page is first selected, no items will be shown. If another page is loaded then the View Live Log page is selected again, it will start a new live log display from a blank screen. It is possible to capture the live log screen by clicking inside the live log screen area and selecting the text in the logging window by simultaneously pressing the “CTRL” key and the “A” key (CTRL-A), copying the text (CTRL-C) and pasting the text into a text editor such as notepad.

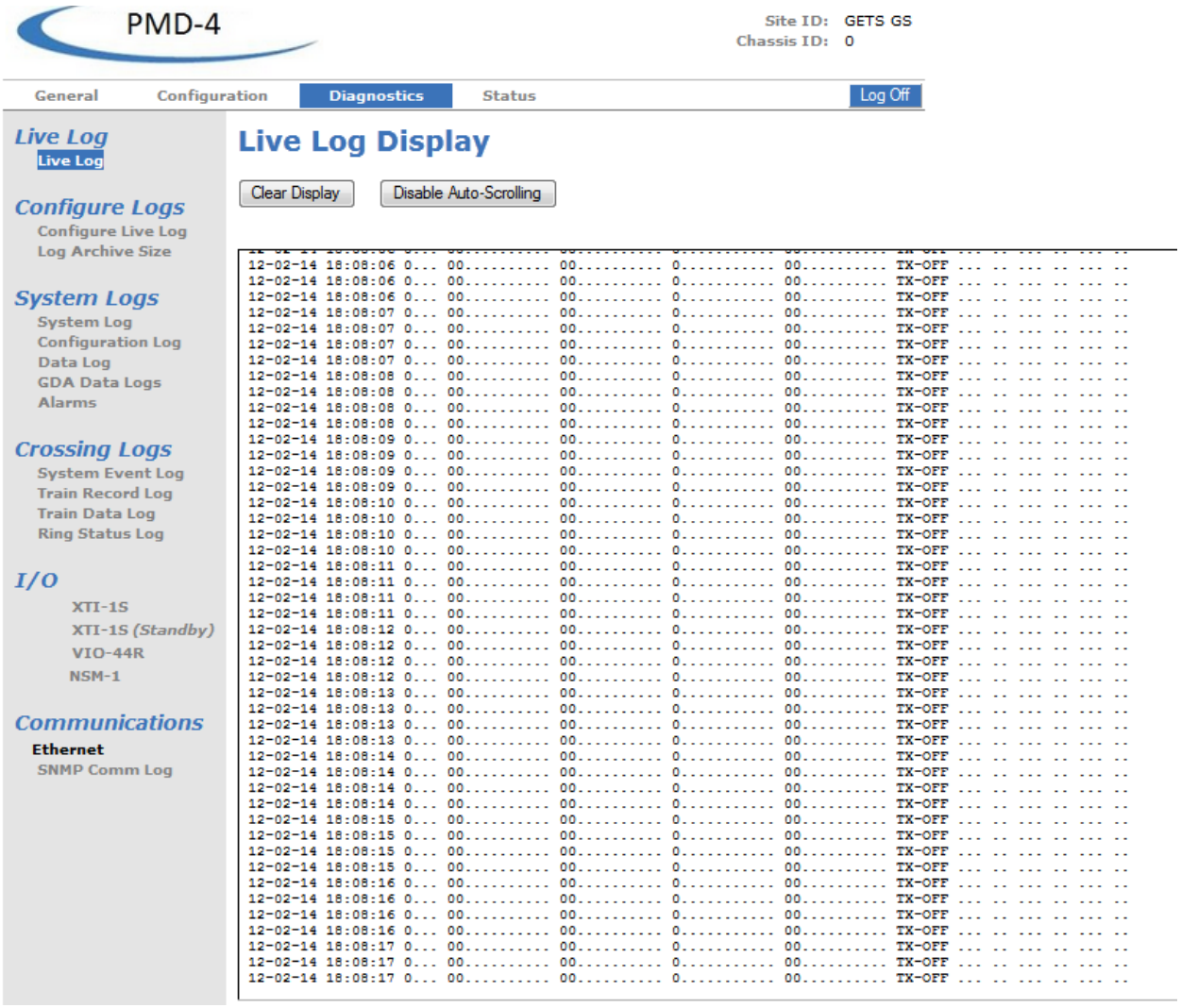
PMD-4
Site ID: GETS GS
Chassis ID: 0
General
Configuration
Diagnostics
Status
Log Off
Live Log
Live Log
Configure Logs
Configure Live Log
Log Archive Size
System Logs
System Log
Configuration Log
Data Log
GDA Data Logs
Alarms
Crossing Logs
System Event Log
Train Record Log
Train Data Log
Ring Status Log
I/O
XTI-1S
XTI-1S (Standby)
VIO-44R
NSM-1
Communications
Ethernet
SNMP Comm Log
Live Log Display
Clear Display
Disable Auto-Scrolling
12-02-14 18:08:06 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:07 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:08 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:09 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:10 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:11 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:12 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:13 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:14 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:15 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:16 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .
12-02-14 18:08:17 0... 00.......... 00.......... 0........... 00.......... TX-OFF ... .

Figure 7-79, Diagnostics - View Live Log

Configure Live Log

The Configure Live Log page allows selection of the specific log information to be displayed on the View Live Log page.

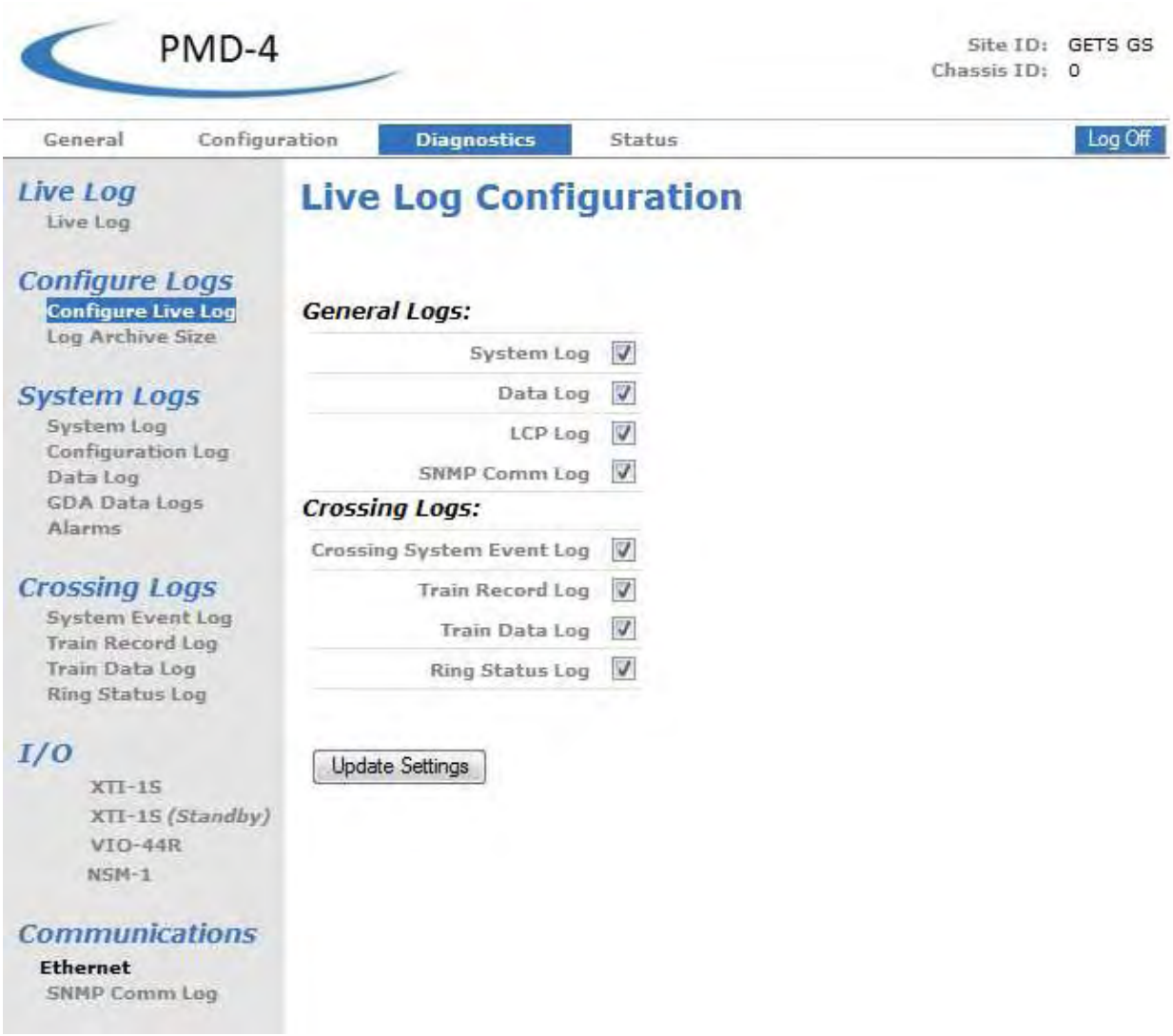

Figure 7-80, Diagnostics - Configure Live Log

System Log

The System Log page displays the contents of the stored system log. Navigation buttons are provided to examine the log by page, by month, day, hour, or minute or going to the beginning or ending of the log. The System Log can be cleared and downloaded to the connected computer via the buttons shown.

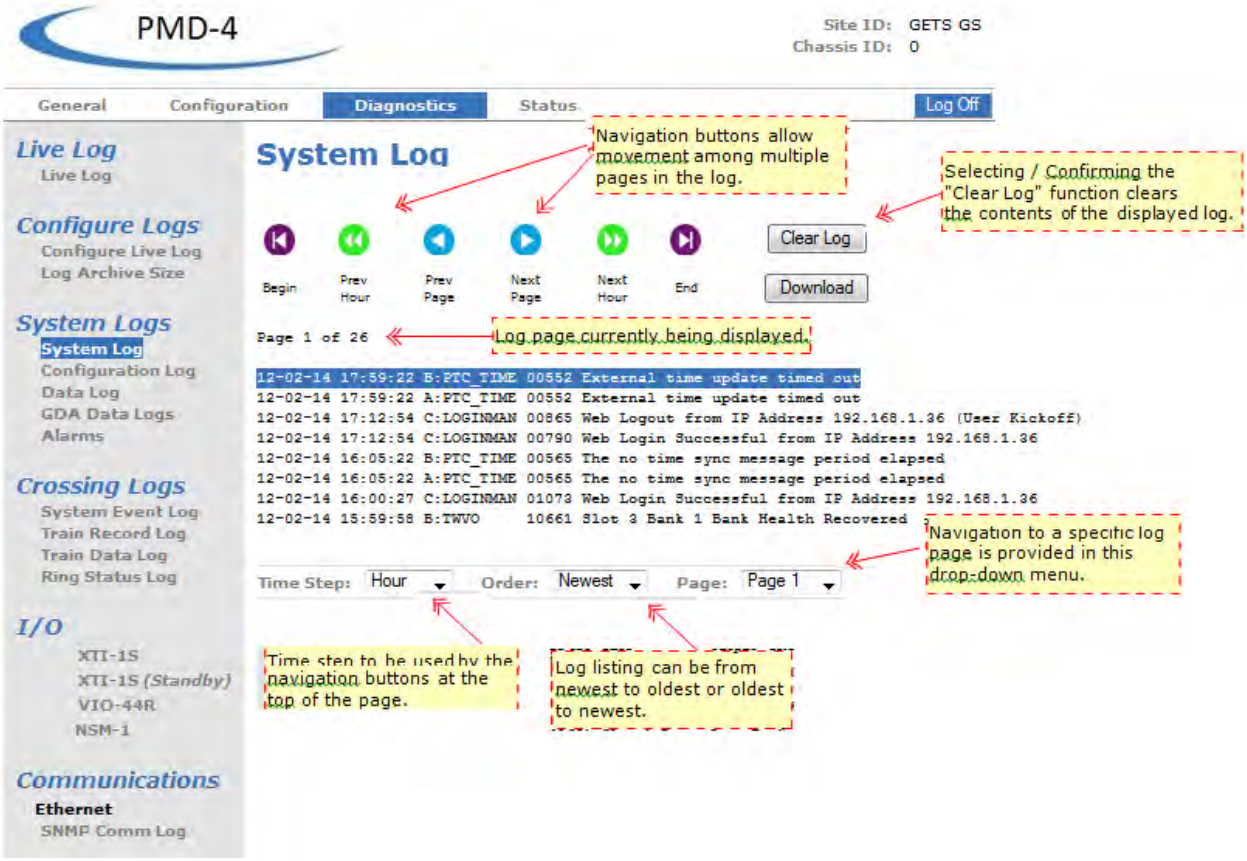
PMD-4
Site ID: GETS GS
Chassis ID: 0
General
Configuration
Diagnostics
Status
Log Off
Live Log
Live Log
Configure Logs
Configure Live Log
Log Archive Size
System Logs
System Log
Configuration Log
Data Log
GDA Data Logs
Alarms
Crossing Logs
System Event Log
Train Record Log
Train Data Log
Ring Status Log
I/O
XTI-1S
XTI-1S (Standby)
VIO-44R
NSM-1
Communications
Ethernet
SNMP Comm Log
System Log
Navigation buttons allow movement among multiple pages in the log.
Selecting / Confirming the "Clear Log" function clears the contents of the displayed log.
Clear Log
Download
Begin
Prev Hour
Prev Page
Next Page
Next Hour
End
Page 1 of 26
Log page currently being displayed.
12-02-14 17:59:22 B:PTC_TIME 00552 External time update timed out
12-02-14 17:59:22 A:PTC_TIME 00552 External time update timed out
12-02-14 17:12:54 C:LOGINMAN 00865 Web Logout from IP Address 192.168.1.36 (User Kickoff)
12-02-14 17:12:54 C:LOGINMAN 00790 Web Login Successful from IP Address 192.168.1.36
12-02-14 16:05:22 B:PTC_TIME 00565 The no time sync message period elapsed
12-02-14 16:05:22 A:PTC_TIME 00565 The no time sync message period elapsed
12-02-14 16:00:27 C:LOGINMAN 01073 Web Login Successful from IP Address 192.168.1.36
12-02-14 15:59:58 B:TWVO 10661 Slot 3 Bank 1 Bank Health Recovered
Navigation to a specific log page is provided in this drop-down menu.
Time Step: Hour
Order: Newest
Page: Page 1
Time step to be used by the navigation buttons at the top of the page.
Log listing can be from newest to oldest or oldest to newest.

Figure 7-81, Diagnostics - System Log

Configuration Log

The Configuration Log page displays the contents of the stored configuration log. Navigation buttons are provided to examine the log by page, by month, day, hour, or minute or going to the beginning or ending of the log. The Configuration Log can be cleared and downloaded to the connected computer via the buttons shown.

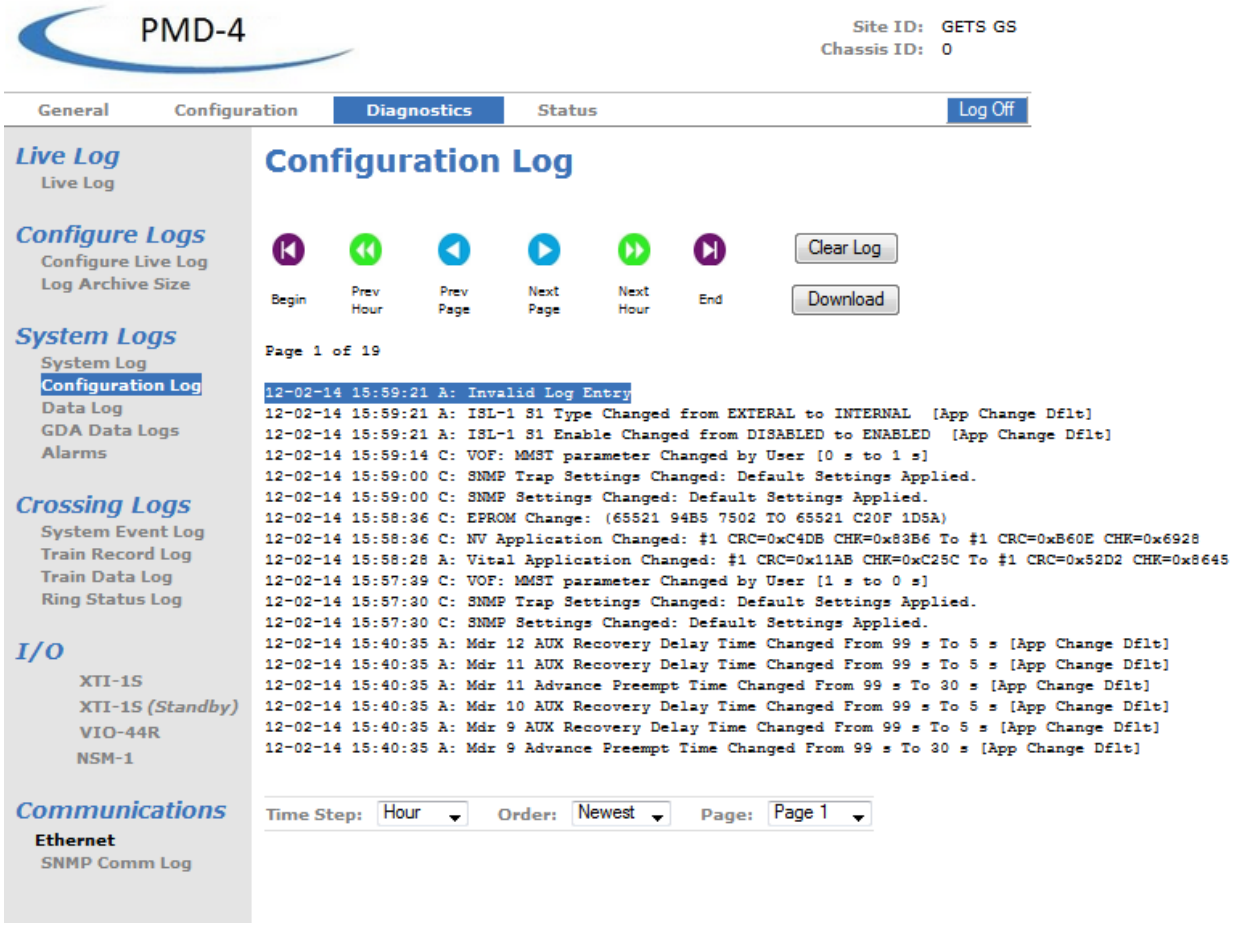
PMD-4
Site ID: GETS GS
Chassis ID: 0
General
Configuration
Diagnostics
Status
Log Off
Live Log
Live Log
Configure Logs
Configure Live Log
Log Archive Size
System Logs
System Log
Configuration Log
Data Log
GDA Data Logs
Alarms
Crossing Logs
System Event Log
Train Record Log
Train Data Log
Ring Status Log
I/O
XTI-1S
XTI-1S (Standby)
VIO-44R
NSM-1
Communications
Ethernet
SNMP Comm Log
Configuration Log
Begin
Prev Hour
Prev Page
Next Page
Next Hour
End
Clear Log
Download
Page 1 of 19
12-02-14 15:59:21 A: Invalid Log Entry
12-02-14 15:59:21 A: ISL-1 S1 Type Changed from EXTERAL to INTERNAL [App Change Dflt]
12-02-14 15:59:21 A: ISL-1 S1 Enable Changed from DISABLED to ENABLED [App Change Dflt]
12-02-14 15:59:14 C: VOF: MMST parameter Changed by User [0 s to 1 s]
12-02-14 15:59:00 C: SNMP Trap Settings Changed: Default Settings Applied.
12-02-14 15:59:00 C: SNMP Settings Changed: Default Settings Applied.
12-02-14 15:58:36 C: EPROM Change: (65521 94B5 7502 TO 65521 C20F 1D5A)
12-02-14 15:58:36 C: NV Application Changed: #1 CRC=0xC4DB CHK=0x83B6 To #1 CRC=0xB60E CHK=0x6928
12-02-14 15:58:28 A: Vital Application Changed: #1 CRC=0x11AB CHK=0xC25C To #1 CRC=0x52D2 CHK=0x8645
12-02-14 15:57:39 C: VOF: MMST parameter Changed by User [1 s to 0 s]
12-02-14 15:57:30 C: SNMP Trap Settings Changed: Default Settings Applied.
12-02-14 15:57:30 C: SNMP Settings Changed: Default Settings Applied.
12-02-14 15:40:35 A: Mdr 12 AUX Recovery Delay Time Changed From 99 s To 5 s [App Change Dflt]
12-02-14 15:40:35 A: Mdr 11 AUX Recovery Delay Time Changed From 99 s To 5 s [App Change Dflt]
12-02-14 15:40:35 A: Mdr 11 Advance Preempt Time Changed From 99 s To 30 s [App Change Dflt]
12-02-14 15:40:35 A: Mdr 10 AUX Recovery Delay Time Changed From 99 s To 5 s [App Change Dflt]
12-02-14 15:40:35 A: Mdr 9 AUX Recovery Delay Time Changed From 99 s To 5 s [App Change Dflt]
12-02-14 15:40:35 A: Mdr 9 Advance Preempt Time Changed From 99 s To 30 s [App Change Dflt]
Time Step: Hour
Order: Newest
Page: Page 1

Figure 7-82, Diagnostics - Configuration Log

Data Log

The Data Log page displays the contents of the stored data log (recorder log). Navigation buttons are provided to examine the log by page, by month, day, hour, or minute or going to the beginning or ending of the log. The Data Log can be cleared and downloaded to the connected computer via the buttons shown.

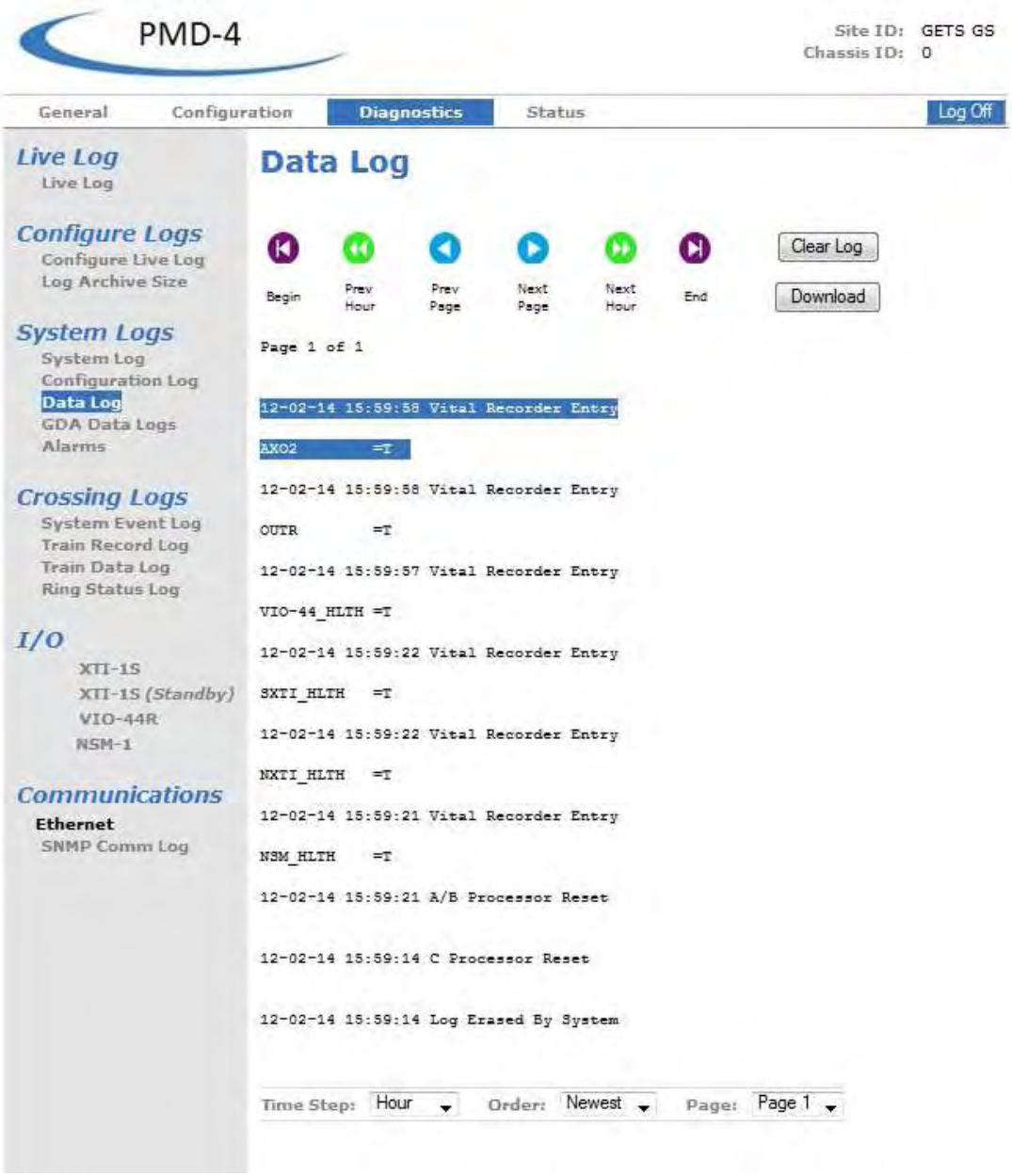

Figure 7-83, Diagnostics - Data Log

GDA Data Logs

The GDA (Graphical Data Analyzer format) Data Logs page allows the vital and non-vital GDA data log to be downloaded to the connected computer. The GDA tool is a licensed, proprietary program that is available through GETSGS (P/N: 838-0038-00-006).

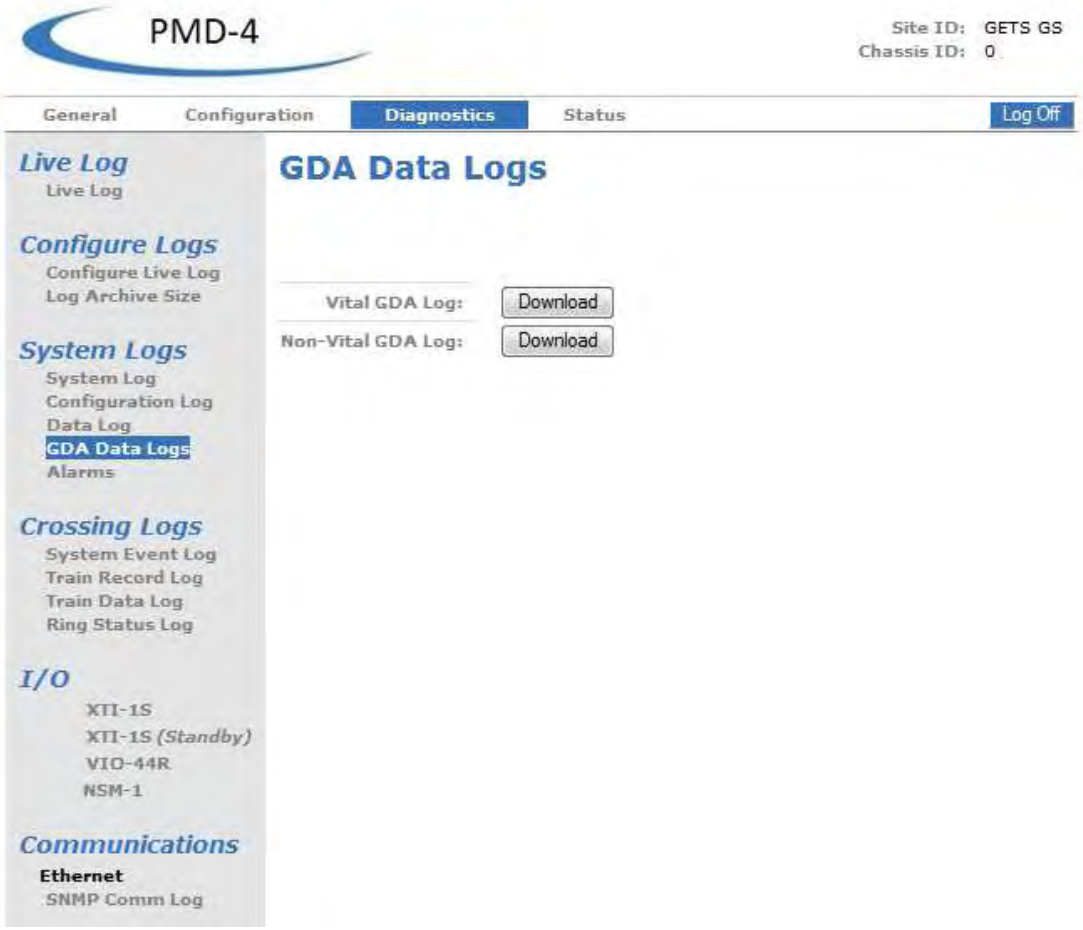

Figure 7-84, Diagnostics - GDA Data Logs

Alarms

The Alarms page displays the alarms that are currently active in the system. If an alarm is clearable, a “Clear” button is displayed next to the alarm entry. Alarms that are not user clearable are displayed without the button. Selecting the “Clear All Alarms” button clears all user-clearable alarms.

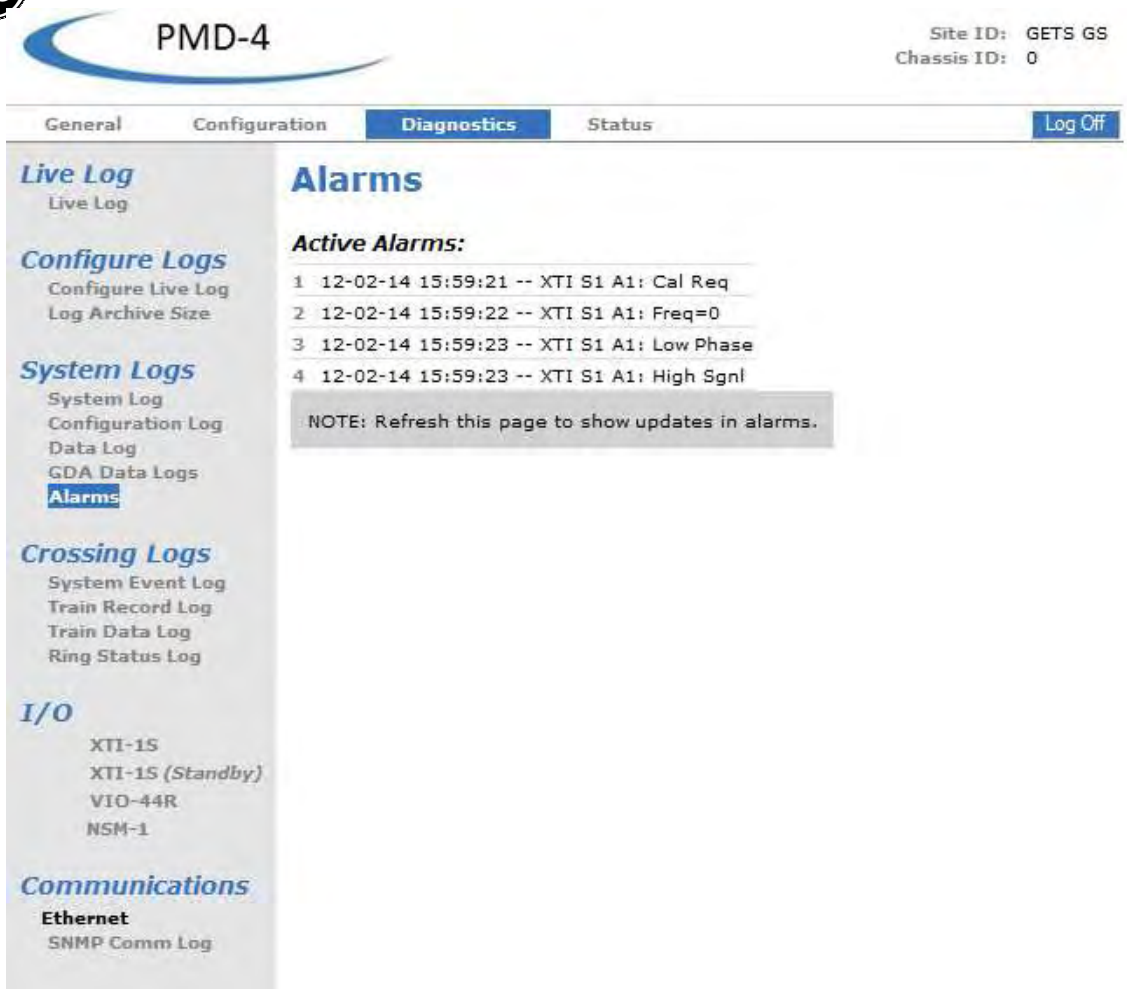

Figure 7-85, Diagnostics – Alarms

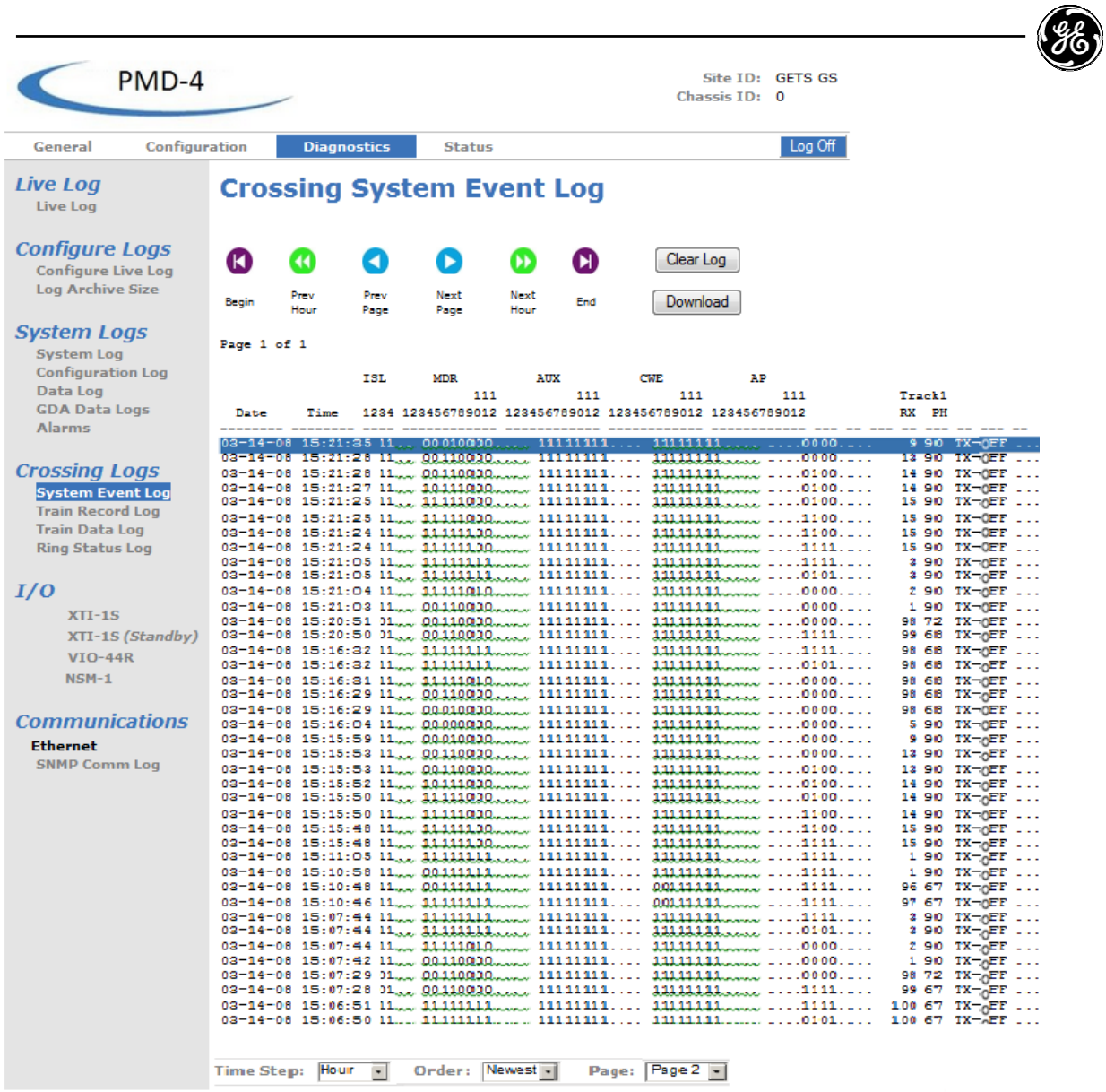

Figure 7-86, Diagnostics – Crossing System Event Log

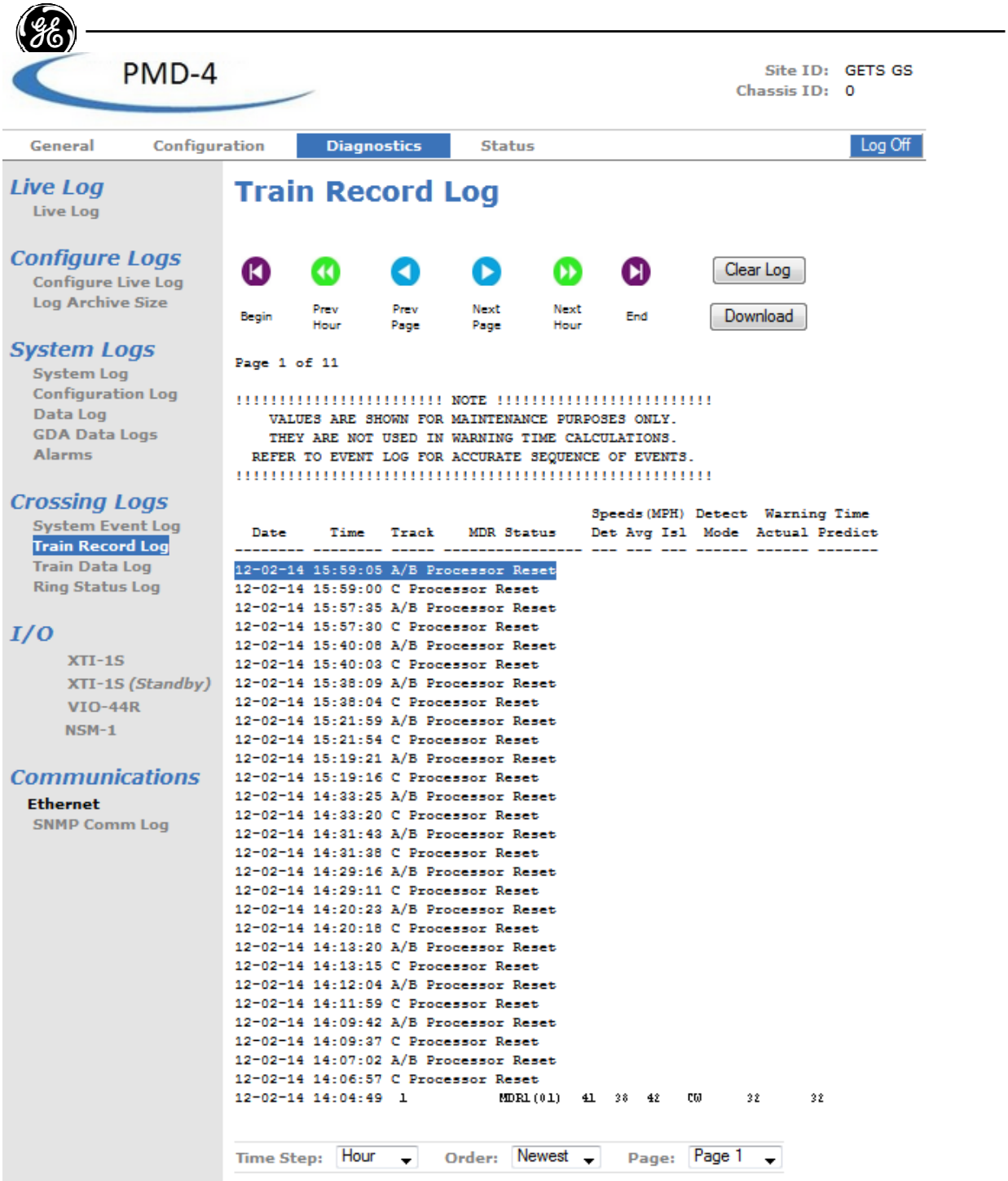

Figure 7-87, Diagnostics – Train Record Log

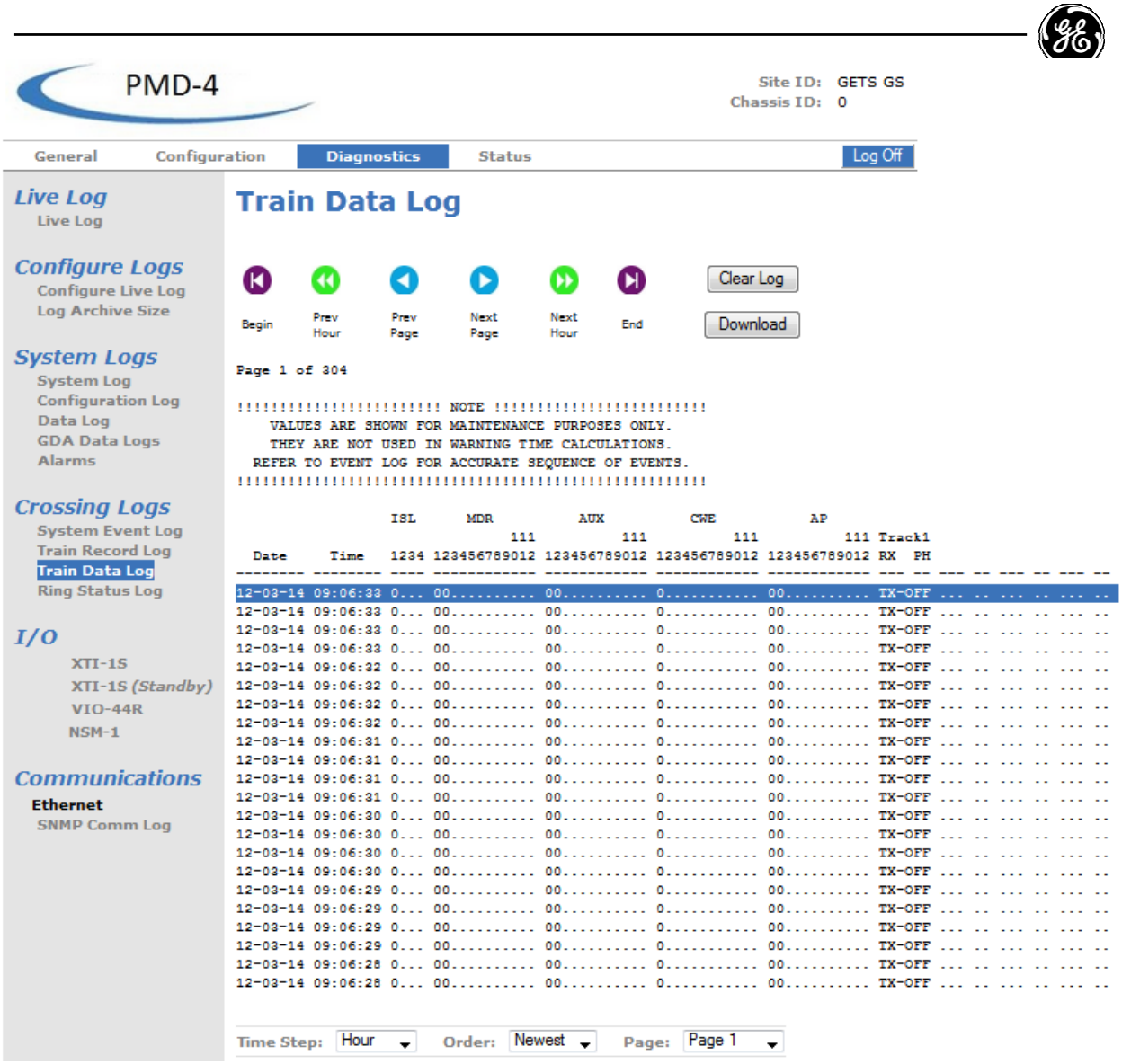
PMD-4
Site ID: GETS GS
Chassis ID: 0
General
Configuration
Diagnostics
Status
Log Off
Live Log
Live Log
Configure Logs
Configure Live Log
Log Archive Size
System Logs
System Log
Configuration Log
Data Log
GDA Data Logs
Alarms
Crossing Logs
System Event Log
Train Record Log
Train Data Log
Ring Status Log
I/O
XTI-1S
XTI-1S (Standby)
VIO-44R
NSM-1
Communications
Ethernet
SNMP Comm Log
Train Data Log
Begin
Prev Hour
Prev Page
Next Page
Next Hour
End
Clear Log
Download
Page 1 of 304
!!!!!!!!!!!!!!!!!!!!!!!! NOTE !!!!!!!!!!!!!!!!!!!!!!!!
VALUES ARE SHOWN FOR MAINTENANCE PURPOSES ONLY.
THEY ARE NOT USED IN WARNING TIME CALCULATIONS.
REFER TO EVENT LOG FOR ACCURATE SEQUENCE OF EVENTS.
!!
ISL MDR AUX CWE AP
111 111 111 111
Date Time 1234 123456789012 123456789012 123456789012 123456789012 Track1 RX PH
12-03-14 09:06:33 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:33 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:33 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:33 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:32 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:32 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:32 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:32 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:31 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:31 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:31 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:31 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:30 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:30 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:30 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:30 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:29 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:29 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:29 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:29 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:28 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
12-03-14 09:06:28 0... 00.......... 00.......... 0.......... 00.......... TX-OFF ... .
Time Step: Hour
Order: Newest
Page: Page 1

Figure 7-88, Diagnostics – Train Data Log

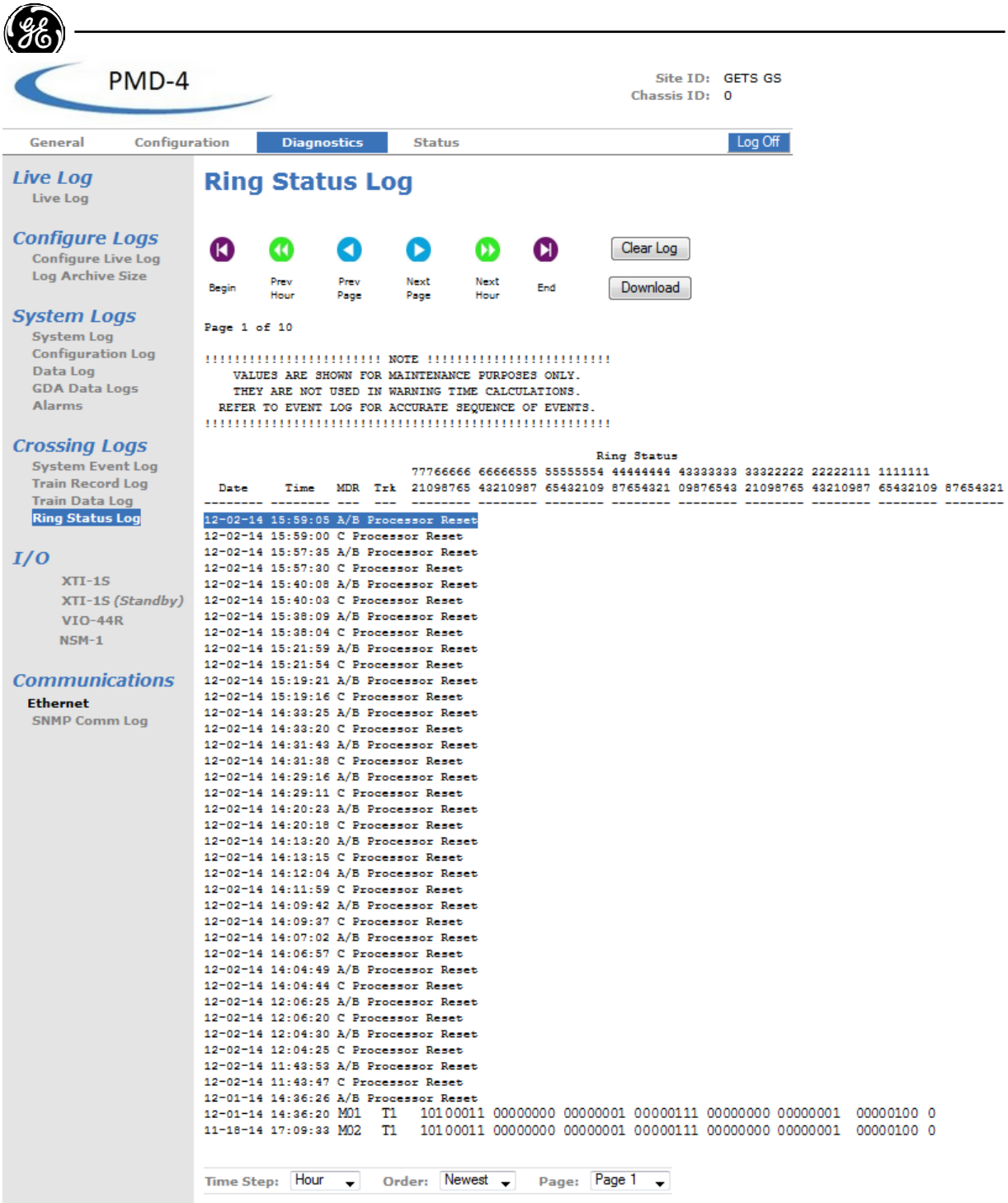

Figure 7-89, Diagnostics – Ring Status Log

View Office Log

Please refer to the ElectroLogIXS VLC manual 100373-010 for office descriptions.

Communication Diagnostics Ethernet

Vital Comm

The Ethernet – Remote page displays communication statistics for overall activity as well as for each individual attached remote.

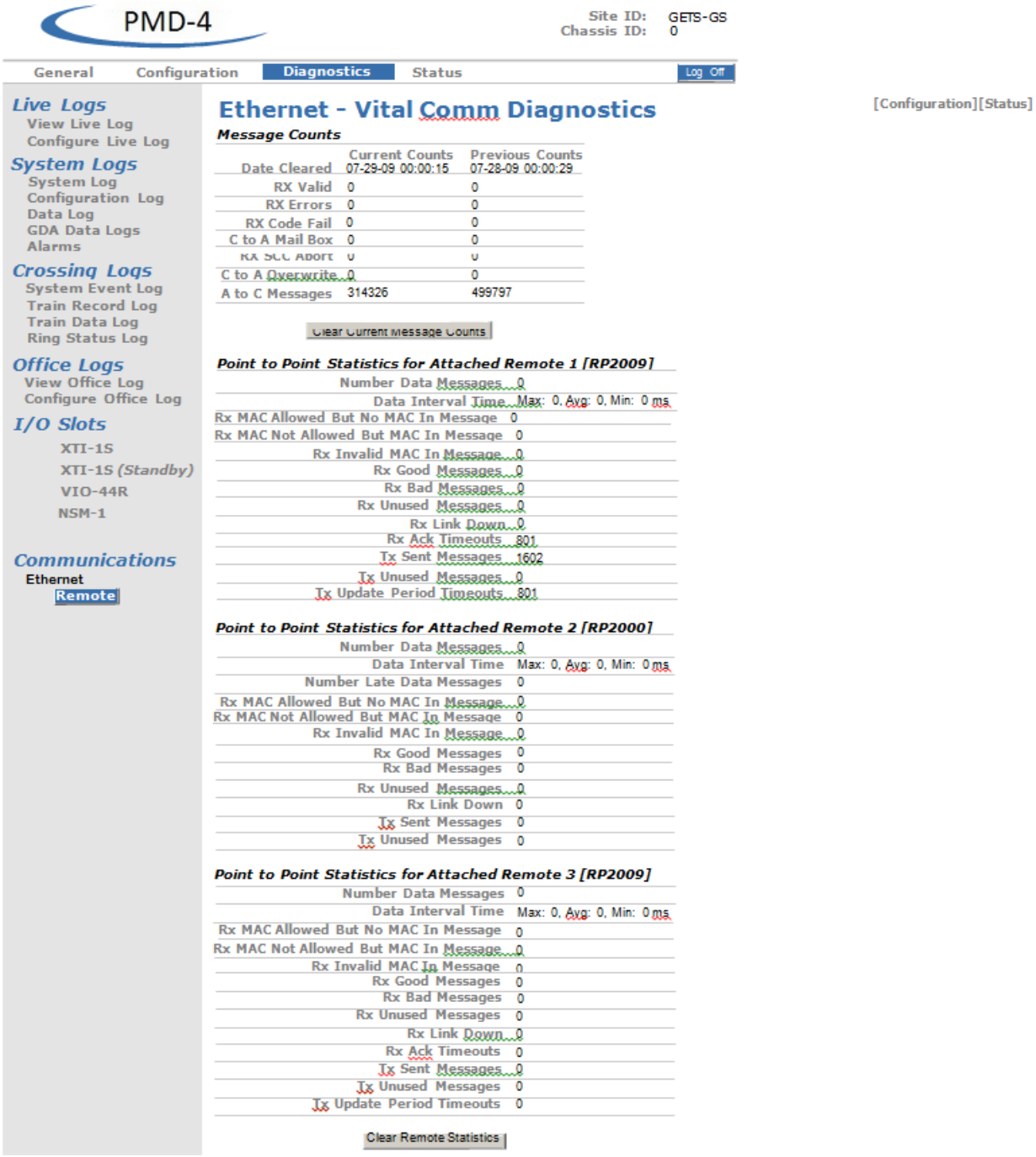
PMD-4
Site ID: GETS-GS
Chassis ID: 0
General
Configuration
Diagnostics
Status
Log Off
Live Logs
View Live Log
Configure Live Log
System Logs
System Log
Configuration Log
Data Log
GDA Data Logs
Alarms
Crossing Logs
System Event Log
Train Record Log
Train Data Log
Ring Status Log
Office Logs
View Office Log
Configure Office Log
I/O Slots
XTI-1S
XTI-1S (Standby)
VIO-44R
NSM-1
Communications
Ethernet
Remote
Ethernet - Vital Comm Diagnostics
[Configuration][Status]
Message Counts
Current Counts
Previous Counts
Date Cleared 07-29-09 00:00:15 07-28-09 00:00:29
RX Valid 0 0
RX Errors 0 0
RX Code Fail 0 0
C to A Mail Box 0 0
C to A Overwrite 0 0
A to C Messages 314326 499797
Clear Current Message Counts
Point to Point Statistics for Attached Remote 1 [RP2009]
Number Data Messages 0
Data Interval Time Max: 0, Avg: 0, Min: 0 ms
Rx MAC Allowed But No MAC In Message 0
Rx MAC Not Allowed But MAC In Message 0
Rx Invalid MAC In Message 0
Rx Good Messages 0
Rx Bad Messages 0
Rx Unused Messages 0
Rx Link Down 0
Rx Ack Timeouts 801
Tx Sent Messages 1602
Tx Unused Messages 0
Tx Update Period Timeouts 801
Point to Point Statistics for Attached Remote 2 [RP2000]
Number Data Messages 0
Data Interval Time Max: 0, Avg: 0, Min: 0 ms
Number Late Data Messages 0
Rx MAC Allowed But No MAC In Message 0
Rx MAC Not Allowed But MAC In Message 0
Rx Invalid MAC In Message 0
Rx Good Messages 0
Rx Bad Messages 0
Rx Unused Messages 0
Rx Link Down 0
Tx Sent Messages 0
Tx Unused Messages 0
Point to Point Statistics for Attached Remote 3 [RP2009]
Number Data Messages 0
Data Interval Time Max: 0, Avg: 0, Min: 0 ms
Rx MAC Allowed But No MAC In Message 0
Rx MAC Not Allowed But MAC In Message 0
Rx Invalid MAC In Message 0
Rx Good Messages 0
Rx Bad Messages 0
Rx Unused Messages 0
Rx Link Down 0
Rx Ack Timeouts 0
Tx Sent Messages 0
Tx Unused Messages 0
Tx Update Period Timeouts 0
Clear Remote Statistics

Figure 7-90, Diagnostics - Remote (Ethernet)

Ethernet Office Comm

Please refer to the ElectroLogIXS VLC manual 100373-010 for office descriptions.

All Statuses

The All Statuses page displays every status name and value for the loaded application program. The Statuses are displayed in alphanumeric order of status name. Checking the “watch” box next to a status name places it on the Watch Statuses page along with other selected statuses.

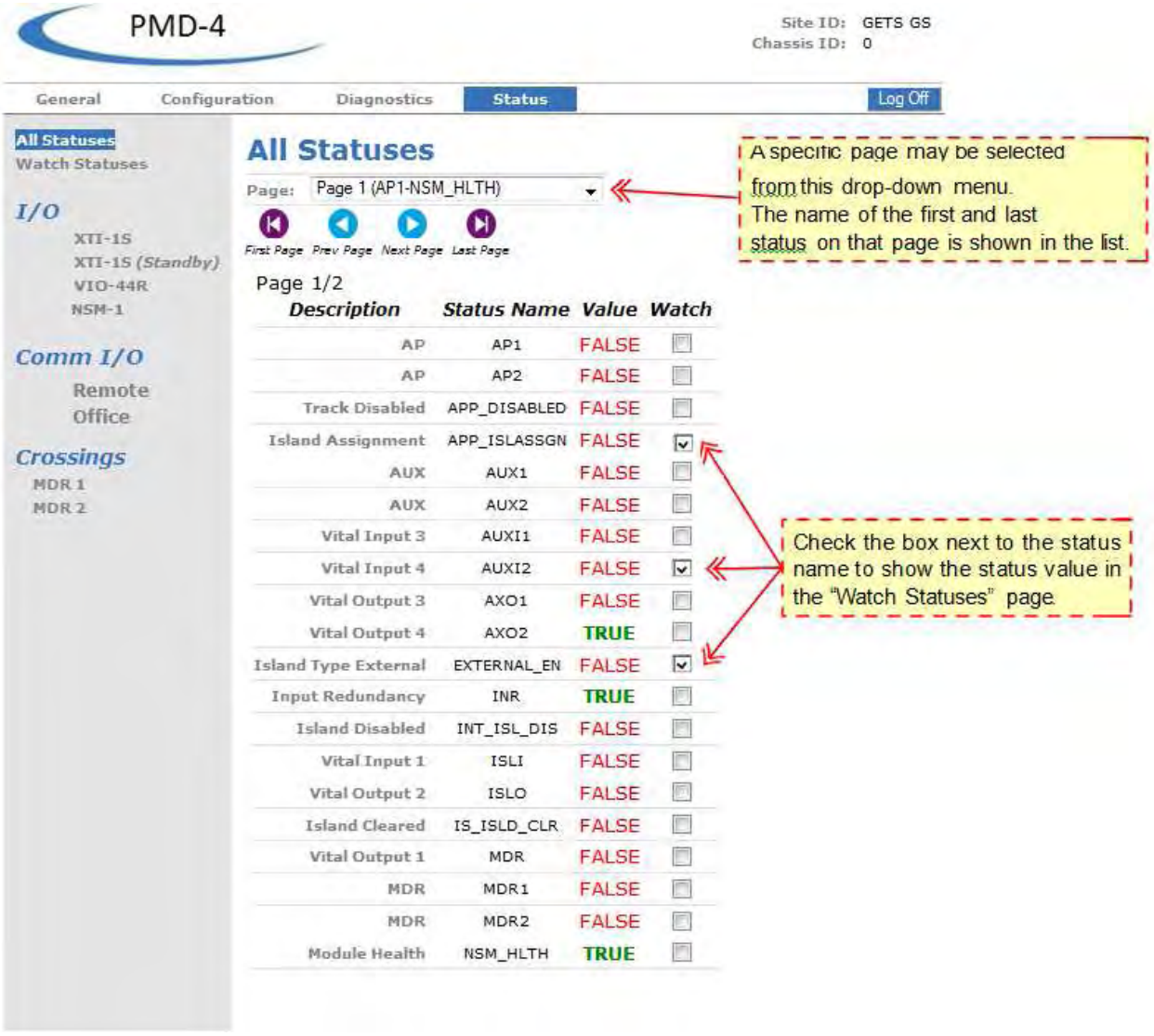

Figure 7-91, Status - All Statuses

Watch Statuses

The Watch Statuses page displays the statuses selected for this page. An individual status may be removed by selecting the check-box of that status or by clearing all selected statuses with the button provided. Up to 100 statuses may be shown on the Watch Statuses page.

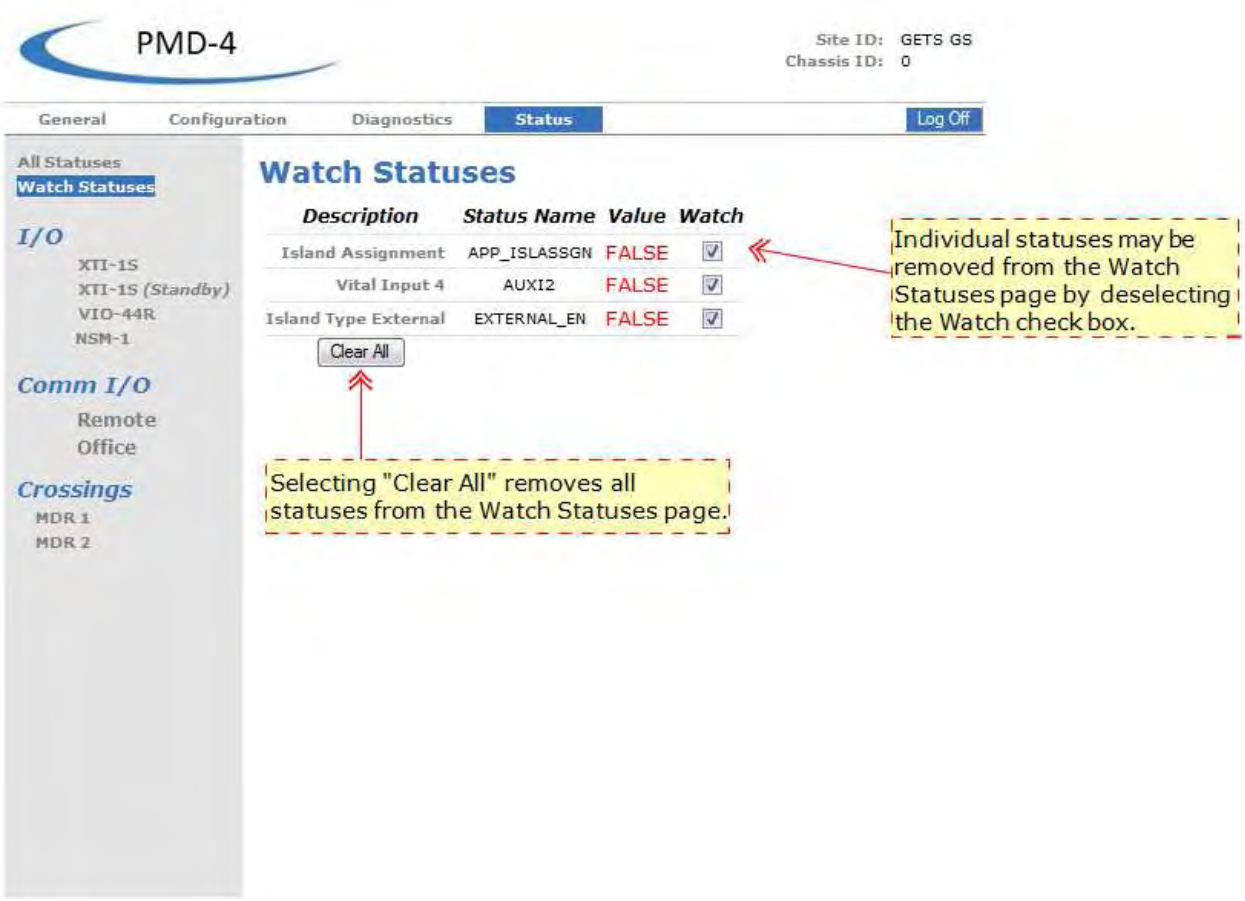

Figure 7-92, Status - Watch Statuses

Remote Statuses

Input and Output statuses to attached vital remotes are displayed on this page using he Ethernet interface type. The upper left drop-down menu selects the remote of interest by remote number.

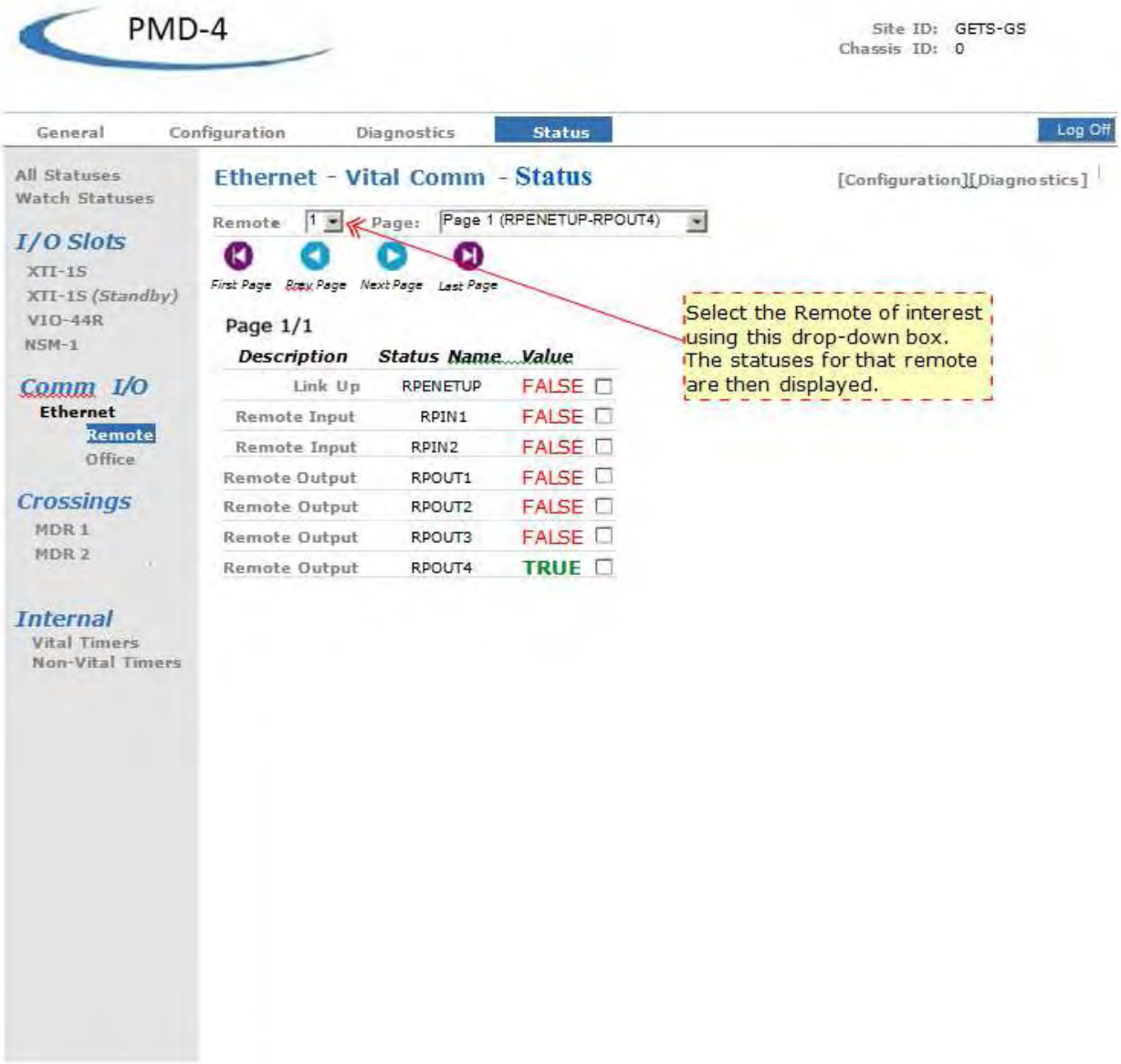

Figure 7-93, Status - Remote (Ethernet)

Office Statuses

Please refer to the ElectroLogIXS VLC manual 100373-010 for office descriptions.

Vital and Non-Vital Timers

The Vital Timers page and Non-vital Timers page each display the state of the Timer Enable status and the remaining time of the Timer Complete for each defined timer. Both the Timer Enable and the Timer Complete may be selected for viewing on the Watch Statuses page.

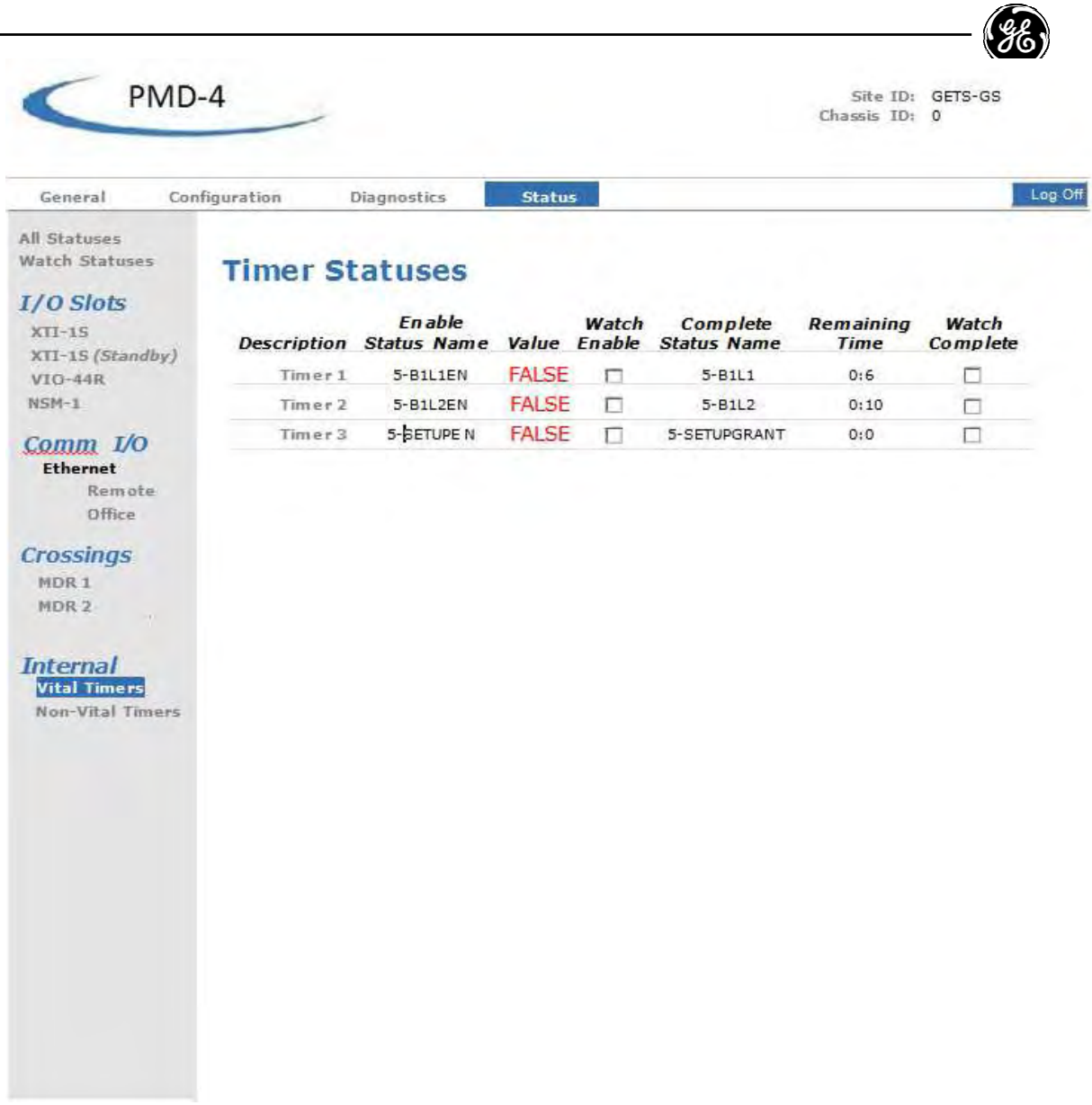

Figure 7-95, Status - Vital Timers

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Chapter 8 – Telnet Terminal Navigation

Telnet Interface

Connecting a diagnostic terminal or a PC (Personal Computer) to the Ethernet port's Telnet Interface allows local control, memory dumps, and more extensive diagnostics than does the CDU (Control Display Unit). Diagnostic terminal commands typed on the keyboard perform various functions, such as examining data or controlling diagnostic terminal logging. Logging to the screen is more convenient than directly to a printer, and, when using a PC, most communications programs allow simultaneous screen and printer logging.

Telnet Interface Connection

To use the Telnet Interface for diagnostic purposes, connect a PC to an Ethernet port of the PMD-4/4R using an Ethernet cable.

Telnet Interface Setup

Ensure the Telnet Interface for the Ethernet port is enabled through the CDU or Web GUI. Using a terminal program, such as HyperTerminal, connect to the IP address that is set for the port on the PMD-4/4R module that you are connecting to. Once connected, a login prompt will be displayed. The username and password for the Telnet Interface may be set through the Web GUI or viewed through either the CDU or the Web GUI. After a definable period of inactivity, the Telnet Interface will be closed. The inactivity timeout may be set through the CDU or Web GUI.

Commands

In addition to the commands listed on the main menu, several additional functions are available.

Z Use the backspace key to correct a keystroke when entering a command.

ENTER Press ENTER to execute a command

H Press H then ENTER to display the main (Help) menu. (Applies to only this Main Menu. It does not apply to the Crossing Logs Menu.)

[ ] Items shown in brackets indicate possible options for the command; you may enter some of these letters or choose to omit them. Do not type in the brackets.

<option> For help on a specific option, type the option letter and a question mark and press the ENTER key.

Menu Options

To display the Menu Options Help screen press ? or H and press the Enter key.

```
  Menu Options
          ?                    -  Help
          H                    -  Help
          C                    -  Checksum/CRC data
          P [A/C/D/E/M]        -  Print Logs
          E [Site ID]          -  Edit Site ID
          I [A/B/C/D/E/X/R/T]  -  Information
          L [E/D]              -  Live Error Output
          R [E/D]              -  Live Data Output
          M [E/D]              -  Live Mnemonic Status
          T [YYMMDDhhmmss]     -  Time and Date
          D [C/R/P/M/L/Z]      -  Communications Diagnostics
          V [N/D/C/T/X/S/F]    -  Office Control Override
          G [V/S/D/A/B/C/L]    -  Remote Config MAC
          X                    -  Crossing Log Menu
          Z [A/D/E]            -  Zap Alarms/Logs
```

Menu Options.

Checksum/CRC Data

Use the Checksum/CRC Data Commands to display the Application SSM Flash Checksum and CRC. To display the Application SSM Flash Checksum and CRC, type C and press the ENTER key.

```
C

Eprom EPT   CRC = C64B Checksum = 0D14
```

Application SSM Flash Checksum and CRC Options.

Print Commands

Use the Print Commands to retrieve recorded data. The data may be displayed on a PC, saved as a file, or printed on a printer. To printer directly to a communications program must be used. To display the Print Commands Screen, type P? and press the ENTER key.

```
P?

Print commands
  P             Print 216DL recorder log
  PA            Print alarm messages
  PM            Print mnemonics
  PM [string]   Print only mnemonics containing string
  PD            Print condensed data dump
  PE            Print errorlog
  PC            Print configuration log
  PR            Print recorder range
```

Print Commands Screen.

This procedure may be used to print Data Logs to a printer, if a printer is connected to you terminal device, or to save the Data Logs to a file if not printer is available. For saving the Data Log to a file, make sure you communication program is set to receive a text file.

Print (P)

The Print function prints status event changes. The data is printed to an attached printer or displayed on an attached PC or terminal.

Type P and press the ENTER key.

```
P


PMD-4 216 Recorder Log                          10-15-14            14:08:26

ELABTESTIWPRACKYYYY

APPLICATION INFORMATION
       NAME                xingextapp2
       EPT CRS             7E48
       EPT CHECKSUM 2E1A


10-15-14 14:08:04
I1           =F

10-15-14 14:08:10
I2           =F

10-15-14 14:06:46
M3           =F M4        =T M7          =T M8         =T
M11          =T M12       =T

10-15-14 14:06:21
M9           =F A2        =T A3          =T A4         =T
C2           =T C3        =T C4          =T I4         =T


10-15-14 14:06:20
C Processor Reset
```

Recorder Log Sample Print Out.

Print Alarm Messages (PA)

The Print Alarm Message function allows you to print system alarm messages. The PMD-4 will store the last 10 system alarms into this log. To Print Alarm Messages, type PA and press the Enter key. The Alarm Messages will be printed.

```
PA

PMD-4 CDU Alarm Log                          10-15-14     10:09:41

PMD-4 TEST RACK

APPLICATION INFORMATION
   NAME             xingextapp
   EPT CRC          E5C7
   EPT Checksum     1C41

 10-15-14 09:31:38 C:ERRLOG     00511 Error Log Erased by User
```

Print Alarm Messages Sample.

If no alarms are present, the screen display will be as shown below:

```
PA

No active alarm(s):
```

No Alarms Present Sample.

Print Mnemonics (PM)

The Print Mnemonics function allows you to print application mnemonics. The status name of the mnemonic is printed as well status condition (True or False). To Print Mnemonics, type PM and press the Enter key. The Mnemonics will be printed.

```
PM

A2          =F    A3          =F    A4          =F    C2          =F
C3          =F    C4          =F    M1          =F    M2          =F
```

Print Mnemonics Sample.

Print Condensed Data Dump (PD)

This function prints the recorded data to be printed on compressed data format. To analyze this type of data you must use the GDA (Graphic Data Analyzer). The Print Condensed Data Dump is the preferred data download mode when troubleshooting assistance is requested from GETSGS. The data is printed to an attached printer or displayed on an attached computer. The GDA is a licensed, proprietary program that is available through GETSGS (P/N: 838-0038-00-006). To print a condensed data dump, type PD and press the ENTER key.

Print Error Log (PE)

The Error Log provides the user with system error messages. Error Log messages contain information such as track setup, lamp setup, and other I/O problems in the system. Up to 1,000 Error Logs may be stored. To print the Error Log, type PE (Print Error Log), and press the ENTER key.

```
PE

PMD-4 Error Log                    10-15-14      10:10:38

PMD-4 TEST RACK

APPLICATION INFORMATION
       NAME          xingestapp
       EPT CRC       E5C7
       ETP Checksum  1C41

10-15-14 09:31:38 C:ERRLOG  00511 Error Log Erased by User
```

Print Error Log Sample.

Print Configuration Log (PC)

The Configuration Log contains changes made to the configuration information. Examples of configurations are crossing parameters, vital configuration settings, and vital timer settings. The PMD-4 will store the last 500 configuration changes into this log. This log is not erasable. To print the Configuration Log, type PC and press the ENTER key.

```
PC

PMD-4 Configuration Log

PMD-4 TEST RACK APPLICATION

INFORMATION
       NAME          xingextapp
       EPT CRC       E5C7
       EPT Checksum  1C41


10-06-14 17:00:57 C: User Log Erased By System
10-07-14 11:33:45 A: Calibrated Gain Changed From 168 To 166 <CDU/DPC/ Cal>
10-07-14 11:33:45 A: Auto-Adjust Gain Changed From 167 To 166 <CDU/DPC/ Cal>
10-07-14 11:55:57 A: Application Selection Defaulted By System
10-07-14 11:58:42 A: Application Changed From #0 CRC=80DC To #65521 CRC=43D8
```

Print Configuration Log Sample.

Print Recorder Range (PR)

The Print Recorder Range function displays the dates (from beginning to end) of the Recorded Data. In the example below, data started being recorded at 11:58:32 on 01-22 and was recorded until 15:03:32 on 02-08. In addition, the Print Recorder Range function displays the number of recorded entries. In the example below, 4216 entries have been recorded.

To print the Recorder Range, type PR and press the ENTER key.

```
PR

Recorded Data Range: 01-22 11:58:32 to 02-08 15:03:32 (4216 entries)
```

Print Configuration Log Sample.

Site ID

The Site ID is a descriptive identifier, up to 80 characters, for the PMD-4 location. For example, it could say "Crossing at 5th and Main" or "Crossing at mile marker 143". To display the Site ID Help screen press E? and press the ENTER key.

```
E      Display Site ID
E[id]  Sets new site ID
```

Site ID Help.

Display Site ID

Use of this function displays the Site ID for the PMD-4 location. To display the Site ID type E and press the ENTER key.

```
E

Site ID: Crossing at 5th and Main
```

Site ID Sample.

Set New Site ID

The Set New Site ID function allows you to enter a new identifier for the PMD-4 site. The Site ID may be up to 80 characters. To set a new Site ID, type E, the new Site ID, and press the ENTER key.

Note: *There is no space between the command and the new Site ID being set.*

```
ECrossing at 6th and Main
```

Set New Site ID Sample.

To display the Information Commands help screen press I? and press the Enter key.

```
Information Commands
  IA - VPM-A Processor
  IB - VPM-B Processor
  IX   XTI DSP-A/B Processor
  IT   Application EPROM
```

Information Commands.

Display VPM A Processor EPROM Information

This function displays the EPROM information for processor A on the VPM Module. To display the EPROM information for processor A, type IA and press the ENTER key.

```
IA

PN:082602-300
Ver:3.0
Module: VPM-3
Processor:A
Copyright: GETS Global Signaling, LLC © 2003/2004
CRC:420A33F5
```

Sample Display of Processor A EPROM Information.

Display VPM B Processor EPROM Information

This function displays the EPROM information for processor B on the VPM Module. To display the EPROM information for processor B, type IB and press the ENTER key.

```
IB

PN:082602-300
Ver:3.0
Module:VPM-3
Processor:B
Copyright: GETS Global Signaling, LLC © 2003/2004
CRC:45C3338B
```

Sample Display of Processor B EPROM Information.

Display XTI-1S DSPM Processor EPROM Information

This function displays the EPROM information for the A and B DSP processors on the XTI-1S module. To display the EPROM information for the DSPs, type IX and press the ENTER key.

```
XTI DSP-A CRC: 00344FA9 DSP-B CRC: 3b2a4778
```

Display Application Information

This function displays the information for the Application installed in the SSM Module. To display the Application information, type IT and press the ENTER key.

```
IT

PMD-4 multi-application EPROM BIGMULTIQTP created 08/09/14 by EPROM
Consolidator Version 5.6 Build: 71056
```

Real Time Error Output

The Real Time Error Output logging function allows you to enable or disable real time error logging to the PC, diagnostic terminal, or printer. The default setting for Real Time Error Output logging is enabled. To display the Real Time Error Output Help screen press L? and press the ENTER key.

```
L?

Live errorlog display commands
  L  - Show current status
  LE - Enable output
  LD - Disable output

Live errorlog display ENABLED
```

Real Time Error Output Commands.

View Real Time Error Output Status

To view the Real Time Error Output Status (Enabled or Disabled), type L and press the ENTER key.

```
L

Live errorlog display ENABLED
```

View Real Time Error Output Status.

Enable Real Time Error Output Status

To enable the Real Time Error Output Status, type LE and press the ENTER key.

```
LE

Live errorlog display ENABLED
```

Enable Real Time Error Output Status.

Disable Real Time Error Output Status

To disable the Real Time Error Output Status, type LD and press the ENTER key.

```
LD

Live errorlog display DISABLED
```

Disable Real Time Error Output Status.

Live Data Log Display

The Live Data Log Display logging function allows you to enable or disable real time Data Log logging to the PC, diagnostic terminal, or printer. The default setting for Live Data Log Display logging is enabled. To display the Live Data Log Display Help screen press R? and press the ENTER key.

```
R?

Live datalog display commands
  R  - Show current status
  RE - Enable output
  RD - Disable output

Live datalog display DISABLED
```

Live Data Log Display.

View Live Data Log Status

To view the Live Data Log Status (Enabled or Disabled), type R and press the ENTER key.

```
R

Live datalog display ENABLED
```

Live Data Log Display Status.

Enable Live Data Log Display

To enable the Live Data Log Display, type RE and press the ENTER key.

```
RE

Live datalog display ENABLED
```

Enable Live Data Log Display.

Disable Live Data Log Display

To disable the Live Data Log Display, type RD and press the ENTER key.

```
RD

Live datalog display DISABLED
```

Disable Live Data Log Display.

Live Mnemonics Display

The Live Mnemonics Display logging function allows you to enable or disable real time Mnemonics logging to the PC, diagnostic terminal, or printer. The default setting for Live Mnemonics Display logging is enabled. To display the Live Mnemonics Help screen press M? and press the ENTER key.

```
M?

Live mnemonic display commands
  M  - Show current status
  ME - Enable output
  MD - Disable output
```

Live Mnemonics Display Help Screen.

View Live Mnemonics Display Status

To view the Live Mnemonics Display Status (Enabled or Disabled), type M and press the ENTER key.

```
M

Live mnemonic display DISABLED
```

Live Mnemonics Display Status.

Enable Live Mnemonics Display

To enable the Live Mnemonics Display, type ME and press the ENTER key.

```
ME

Live mnemonic display ENABLED
```

Enable Live Mnemonics Display.

Disable Live Mnemonics Display

To disable the Live Mnemonics Display, type MD and press the ENTER key.

```
MD

Live mnemonic display DISABLED
```

Disable Live Mnemonic Display.

Time and Date

To display the Time and Date Commands screen press T? and press the Enter key.

```
Time and date commands
  T                - Display current time and date
  T YYMMDDhhmmss - Set the time and date
```

Time and Date Commands

Display Time and Date

The Time and Date are displayed in MMDDYYhhmmss format. The date is displayed according to the 24 hour clock (i.e 3:00 PM is 1500). To display Time and Date:

1. Type T and press the ENTER key. The time and Date will be displayed. Display will be similar to the message shown below.

   Current date & time: 07-20-14 10:37:28

Set Time and Date

The Time and Date are set to the YYMMDDhhmmss format. To set the Time and Date to July 20, 2015 at 45 seconds after 1:00 PM

Type T140720130044 and press the ENTER key.

Communications Diagnostics

With the PMD-4 Ethernet interface, use of the Communications Diagnostics Commands can selectively enable logging of changes in either Office Controls and Indications, inbound and outbound Office Protocol (GENISYS® only) or LCP messages, and the raw message data received on the Office port to either the DT console or a stored memory log. Other features available in the Communications Diagnostics Commands include full or partial stored memory log display, display of locally maintained communications counters, and clearing of the locally maintained communications counters. To display the Communications Diagnostics Commands Help screen, type D and press the ENTER key.

```
Communications diagnostics commands
 D  - Show current status
 DMx- Dump Memory Log (F = Forward, B = Backward)
 DMF- Forward, All                    DMB- Backward, All
 DMF- 5/1/14 17:30 - 5/1/14 18:00     DMB- 5/1/14 17:30 - 5/1/14 18:00
 DCC- Enable/Disable Ctrl/Ind output  DCM- Enable/Disable Ctrl/Ind to Memory
 DPC- Enable/Disable Protocol output  DPM- Enable/Disable Protocol to Memory
 DRC- Enable/Disable Raw Data output  DRM- Enable/Disable Raw Data to Memory
 DZ - Display Port Message Counts     DZC- Clear Message Counts
 DL - Enable/Disable LCP diag output  DD - Disable All Logging

Control/Indication Logging, Console= DISABLED  Memory= DISABLED
Protocol Logging,          Console= DISABLED    Memory= DISABLED
Raw CodeLine Data Logging,  Console= DISABLED  Memory= DISABLED
LCP Logging,               Console= DISABLED
.
```

Communications Diagnostics Command Help Screen

Logging Options Modification

Several Communications Diagnostics Commands enable or disable DT console or stored memory logging of various types of communications information. Each logging option is individually enabled and any combination of logging options can be concurrently enabled. The following logging options are supported:

1. Changes to Office Controls and Indications (DCC, DCM)
2. GENISYS®, BCS Protocol messages (DPC, DPM)
3. GENISYS®, BCS port (Codeline) raw message data (DRC, DRM)

Prior to setting any logging option, display the current log option settings by typing D and press the ENTER key. Check the current state of the logging option and if it is disabled, type the desired option (e.g., DCC to enable DT console logging of Office Controls a nd Indications) and press the ENTER key. The DT console will display the updated logging options states.

To disable a logging option, verify the logging option is enabled and if it is, type the desired option (e.g., DCC to disable DT console logging of Office Controls and Indications) and press the ENTER key. While each logging option must be individually enabled, all logging options may be collectively disabled. The DT console will display the updated logging options states.

To disable all logging options, type DD and press the ENTER key. The DT console will display the updated logging options states.

Logging option enabling, disabling, and clearing are illustrated in the following example:

```
Communications diagnostics commands
 D  - Show current status
 DMx- Dump Memory Log (F = Forward, B = Backward)
 DMF- Forward, All                    DMB- Backward, All
 DMF- 5/1/14 17:30 - 5/1/14 18:00     DMB- 5/1/14 17:30 - 5/1/14 18:00
 DCC- Enable/Disable Ctrl/Ind output  DCM- Enable/Disable Ctrl/Ind to Memory
 DPC- Enable/Disable Protocol output  DPM- Enable/Disable Protocol to Memory
 DRC- Enable/Disable Raw Data output  DRM- Enable/Disable Raw Data to Memory
 DZ - Display Port Message Counts     DZC- Clear Message Counts
 DL - Enable/Disable LCP diag output  DD - Disable All Logging

Control/Indication Logging,      Console= ENABLED          Memory= DISABLED
Protocol Logging,                Console= DISABLED         Memory= ENABLED
Raw CodeLine Data Logging,       Console= ENABLED          Memory= DISABLED
LCP Logging,                     Console= DISABLED
DRC

Control/Indication Logging,      Console= ENABLED          Memory= DISABLED
Protocol Logging,                Console= DISABLED         Memory= ENABLED
Raw CodeLine Data Logging,       Console= DISABLED         Memory= DISABLED
LCP Logging,                     Console= DISABLED
DD

Control/Indication Logging,      Console= DISABLED         Memory= DISABLED
Protocol Logging,                Console= DISABLED         Memory= DISABLED
Raw CodeLine Data Logging,       Console= DISABLED         Memory= DISABLED
LCP Logging,                     Console= DISABLED
```

Communications Logging Options

Logging Outputs

The following is an example of the outputs generated when control and indication logging is enabled. In this example, 32 controls and indications are active and are sequentially displayed in groups of eight starting with the first control / indication. The timestamps show when each entry occurred.

```
01-19-14  02:54:55  ConL   032    00000000   00000000   00000000   00000000
01-19-14  02:54:55  Ind    032    00000000   00000000   00000000   00000000
01-19-14  02:55:21  ConL   032    11111111   11111111   11111111   11111111
```

Control/Indications Log Example

The following is an example of the outputs generated when Office protocol logging is enabled. The ">"symbol denotes received on the office port (port B) while the "<" symbol denotes responses transmitted to the office. The message type follows these symbols while the log entry terminates with a hexadecimal representation of the message's contents. The timestamps show when each entry occurred.

```
01-19-14 02:54:55 GENISYS >Control       Port B: fc 01 00 00 01 00 02 00 03 00 e0 01 1f 87 f6
01-19-14 02:54:55 GENISYS <Indication    Port B: f2 01 e0 01 eb 78 f6
01-19-14 02:54:55 GENISYS >ACK & Poll    Port B: fa 01 83 60 f6
01-19-14 02:54:55 GENISYS <No Indication Port B: f1 01 f6
01-19-14 02:54:55 GENISYS >Poll          Port B: fb 01 82 f0 f6
```

Genisys Protocol Log Example

```
08-11-14 13:06:41 BCS < ACK              Port N: 03 ff 01 d0
08-11-14 13:06:41 BCS > First Poll       Port N: 03 ff 02 a8
08-11-14 13:06:41 ConUP 0032 10101010   00000000   00000000   00000000

08-11-14 13:06:41 BCS < ACK              Port N: 03 ff 01 d0
08-11-14 13:06:42 BCS > Poll             Port N: 03 ff 02 a8
08-11-14 13:06:42 BCS < No Indication    Port N: 03 ff 02 a8
08-11-14 13:06:42 BCS > Control          Port N: 03 01 55 80 fc fe aa 7f
08-11-14 13:06:42 ConUP 0032 10101010   00000000   00000000   00000000
```

BCS Indication/Control and Protocol Logging Example

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The Genisys® log entry message types are shown in the following table.

Message Text	Description
>Control	Received Control Message
< Resend Ind	Retransmitted Indication Data message
> Poll	Received Poll message
> Recall	Received Recall Indications message
< No Indication	Transmitted Acknowledge Master message
< Indication	Transmitted Indication Data message
< Control Verify	Transmitted Control Check-Back
> ACK & Poll	Received Acknowledge Data message
> Execute Command	Received Execute Controls message
> Unknown Msg	Received a message directed to another station (different unit address)
> Incomplete Msg	Received incomplete message
> Bad CRC	Received a message is with invalid CRC
> Execute Unexptd	Received Execute Controls message without a preceding Control message
> Invalid Message	Received a message with an undefined header
> Control Too Long	Received a Control message with too many bits
> Date/Time	Received a Date/Time Update message
< ACK Master	Transmitted an ACK & Poll message

The BCS log entry message types are shown in the following table.

Message Text	Description
>Control	Valid control request
> Poll	Valid poll request
< Indication	Indication data for a recall or poll request
> Unknown Msg	This message is addressed to another field unit
> Invalid BCH	The transmitted BCH does not equal the calculated BCH
> Test Request	Valid diagnostic request
< Test Indication	Response to diagnostic request (echo)
> Invalid Ctrl	Control with an invalid port or invalid complement.
> Disconnect	Valid disconnect modem request
< ACK	Acknowledgment of a valid control
< NAK	Acknowledgment of an invalid control
< No Indication	No Changes for a poll request
> Recall	Valid recall request
> First Poll	First poll request following a modem connect.
> Invalid Message	An incomplete or invalid message was received

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The following is an example of the outputs generated when raw CodeLine data logging is enabled. Each entry contains a timestamp of when the event occurred, the port involved, the protocol associated with the port, the data's transmission direction (LOC/RECV for inbound data and SEND for outbound), and the raw data in hexadecimal format. Received data is displayed a byte at a time with a byte counter (reset with each inbound message) while a complete transmitted message is displayed in each entry.

```
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 00 fc    107.12 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 01 01          1. 3 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 02 00       1. 3 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 04 01          1. 3 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 05 00          1. 5 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 06 02          1. 3 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 07 00          1.40 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 08 03          0.67 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 09 00          1. 4 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 0a e0          1.18 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 0b 01          0.89 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 0c 1f          1. 6 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 0d 87          1. 2 ms
01-19-14 02:54:55 GENISYS LOC/RECV      Port B: 0e f6          1. 4 ms
01-19-14 02:54:55 GENISYS SEND          Port B: f2 01 e0 01 eb 78 f6
```

Genisys Raw Data Log Example

```
08-11-14 13:15:53 BCS LOC/RECV          Port N: 00 03  303.3 ms
08-11-14 13:15:53 BCS LOC/RECV          Port N: 01 01    9.9 ms
08-11-14 13:15:53 BCS LOC/RECV          Port N: 02 55   10.0 ms
08-11-14 13:15:53 BCS LOC/RECV          Port N: 03 80    9.9 ms
08-11-14 13:15:53 BCS SEND              Port N: 03 ff 01 d0
```

BCS Raw Data Logging

ATCS Logging Outputs

Please refer to the ElectroLogIXS VLC manual 100373-010 for office descriptions.

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Use this to access the MAC related commands. To display the Remote Config MAC related Help screen, type G and press the ENTER key.

```
G

Remote Config MAC Commands
 GV    - Upload MAC Key Vault file [Usage: GV <MAC-Key-Vault-filename> <-
         iIpAddress>]
 GSS   - SwitchOver - Initiate/Restart [Switchover Enable, Switchover Restart]
 GSC   - SwitchOver - Cancel [Switchover Cancel]
 GD    - Delete Upload MAC Key Vault
 GA    - Toggle - Rmt - Send Msgs With MAC In layer3 [MAC=ENABLED/DISABLED]
 [Usage:
         GA <Rmt#
           ..>]
 GB    - Toggle - Rmt - Send Msgs With New MAC Link Key [Use New Key=YES/NO]
 [Usage:
            GB
        <Rmt#..>]
 GC    - Display Current Values
 GL    - Enable/Disable MAC Related Debug Logging [Usage: GL <mask>]
```

MAC Key Vault Load

To load the MAC Key Vault file from a local computer, the computer must have TFTP (Trivial File Transfer Protocol) server software installed.

- Confirm the Ethernet settings on the local computer, and the PMD-4 system including the IP Address, Subnet Mask and the Default Gateway via the CDU interface (Figure 6-43, Ethernet Config Menu) or the Web GUI interface (Figure 7-56, Configuration - General Ethernet).

- When these settings are correct, ensure that the TFTP server is running on the computer and has visibility to the directory with the MAC Key Vault file.

- On the VPM-3 diagnostic terminal, enter command to load the MAC Key Vault file.

```
GV application.mvlt –i192.168.1.12
```

- After the transfer has completed successfully, text similar to the following will be displayed on the diagnostic terminal:

```
09-08-09 12:15:19  VOFD: Tftp from 192.168.1.12 done;
file:APPLICATION.MVLT, msg: Transferred 772 bytes (60890617 blocks) in 0.0
seconds, status:ok(0)
09-08-09 12:15:19  VOFM: Verifying uploaded Mac Vault file  ..  ok,
vaultCrc=0x17401D81
09-08-09 12:15:19  VOFD: New MAC Key Vault APPLICATION.MVLT Has Been
Successfully Uploaded
```

Note: *If the above is not seen, confirm the Ethernet settings on the local computer and the PMD-4 system. If all are correct it may be necessary to determine if the computer firewall is not allowing TFTP access. Contact the network administrator to confirm.*

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Crossing Logs Menu

To display the Crossing Logs Menu press X and press the ENTER key.

```
X

Crossing Logs Menu
       NAME          - Change unit name ()
       TR            - Train Record Log Menu
       TD            - Train Data Log Menu
       SE            - System Event Log Menu
       RT            - Real Time Memory Log Menu
       RS            - Ring status Log Menu
       CS            - Crossing System Setup
       ZX            - Zap Crossing Log Menu
       Enter         - Return to previous menu

Enter Selection >>
```

Crossing Unit Name

The name of a Crossing chassis can be entered by typing NAME at the prompt and pressing ENTER as shown below.
The name is limited to 20 alphanumeric characters or spaces.

```
Crossing Logs Menu
       NAME          - Change unit name ()
       TR            - Train Record Log Menu
       TD            - Train Data Log Menu
       SE            - System Event Log Menu
       RT            - Real Time Memory Log Menu
       RS            - Ring Status Log Menu
       CS            - Crossing System Setup
       ZX            - Zap Crossing Log Menu
       Enter         - Return to previous menu

Enter Selection >>
Name Current Name>>
Enter New Name >> TEST CHASSIS
```

Train Record Log Menu

Each time a train occupies the island, The PMD-4 generates a Train Record Log entry to provide a history of crossing related information for each train move. The PMD-4 will store the last 1000 train moves into this Log.

The Train Record Log contains the following type of information:

- Associated MDR Status Mnemonic/Number
- Associated Approach Track Circuit Number (1-4)
- Train's Detect Speed
- Train's Average Speed
- Train's Island Speed

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- Actual Warning time
- Predicted Warning Time
- Detection Mode

To display the Train Record Log Enable/Disable menu, enter TR at the prompt and press ENTER.

```
Crossing Logs Menu
       NAME - Change unit name ()
       TR - Train Record Log Menu
       TD - Train Data Log Menu
       SE - System Event Log Menu
       RT - Real Time Memory Log Menu
       RS - Ring Status Log Menu
       CS - Crossing System Setup
       ZX - Zap Crossing Log menu
       Enter - Return to previous menu

Enter Selection  >> TR

Crossing Train Record Log Menu
       E      - Enable Live Train Record Logging
       *D     - Disable Live Train Record Logging
       P      - Print Train Record Log
       Enter  - Return to previous menu or stop printing
```

Enable Train Record Logging

To enable Train Record Logging, enter E at the prompt and press ENTER.

```
Enter Selection >> E

Live Crossing Train Record Logging ENABLED

Crossing Train Record Log Menu
       *E     - Enable Live Train Record Logging
       D      - Disable Live Train Record Logging
       P      - Print Train Record Log
       Enter  - Return to previous menu or stop printing
```


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Disable Train Record Logging

To disable Train Record Logging, enter D at the prompt and press ENTER.

```
Enter Selection >> D

Live Crossing Train Record Logging DISABLED

Crossing Train Record Log Menu
       E      - Enable Live Train Record Logging
       *D     - Disable Live Train Record Logging
       P      - Print Train Record Log
       Enter  - Return to previous menu    or stop printing
```

Display Train Record Log

To display the Train Record Log, enter P at the prompt and press ENTER.

```
Enter Selection >> P

PMD-4 Train Record Log                  10-12-14     16:40:35

APPLICATION INFORMATION
       NAME               xingextapp
       EPT CRC            E5C7
       EPT Checksum  1C41

!!!!!!!!!!!!!!!!!!!!!!!! NOTE !!!!!!!!!!!!!!!!!!!!!!!!!!
     VALUES ARE SHOWN FOR MAINTENANCE PURPOSES ONLY.
     THEY ARE NOT USED IN WARNING TIME CALCULATIONS.
   REFER TO EVENT LOG FOR ACCURATE SEQUENCE OF EVENTS.
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

                                          Speeds(MPH) Detect Warning Time
Date       Time    Track   MDR   Status  Det Avg Isl  Mode  Actual  Predict
-------- --------  ----- --------------- --- --- --- ------ ------ -------
10-12-04 12:10:16    1           M1(01)    33  +++   1   CW     25     25
```


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Returning to the Previous Menu

To return to the previous menu selection, press ENTER at the Enter Selection prompt.

```
Crossing Train Record Log Menu
       *E     - Enable Live Train Record Logging
       D      - Disable Live Train Record Logging
       P      - Print Train Record Log
       Enter  - Return to previous menu or stop printing

Enter Selection >>

Crossing Logs Menu
       NAME   - Change unit name ()
       TR     - Train Record Log Menu
       TD     - Train Data Log Menu
       SE     - System Event Log Menu
       RT     - Real Time Memory Log Menu
       RS     - Ring Status Log Menu
       CS     - Crossing System Setup
       ZX     - Zap Crossing Log menu
       Enter  - Return to previous menu
```

Train Data Log Menu

The Train Data Log stores 350msec samples of crossing related data 30 seconds prior to any MDR status going false, and 10 seconds after the MDR status goes true. The PMD-4 will store the last 3000 entries into this log.

The Train Data Log contains the following type of information:

1) Track RX
2) Track Phase
3) Train Speed
4) Track Island
5) MDR Output Statuses
6) AUX Input Statuses
7) RSO Input Status
8) Advance Preempt Input Statuses

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To display the Train Data Log Enable/Disable menu, enter TD at the prompt and press ENTER.

```
Crossing Logs Menu
       NAME - Change unit name ()
       TR     - Train Record Log Menu
       TD     - Train Data Log Menu
       SE     - System Event Log Menu
       RT     - Real Time Memory Log Menu
       RS     - Ring Status Log Menu
       CS     - Crossing System Setup
       ZX     - Zap Crossing Log menu
       Enter  - Return to previous menu

Enter Selection >> TD

Crossing Train Data Log Menu
       E      - Enable Live Train Data Logging
       *D     - Disable Live Train Data Logging
       P      - Print Crossing Train Data Log
       Enter  - Return to previous menu or stop printing
```

Enable Train Data Logging

To enable Train Data Logging, enter E at the prompt and press ENTER.

```
Enter Selection >> E

Crossing Train Data Log Menu
       *E     - Enable Live Train Data Logging
       D      - Disable Live Train Data Logging
       P      - Print Crossing Train Data Log
       Enter  - Return to previous menu or stop printing
```

Disable Train Data Logging

To disable Train Data Logging, enter D at the prompt and press ENTER.

```
Enter Selection >> TD

Crossing Train Data Log Menu

       E      - Enable Live Train Data Logging
       *D     - Disable Live Train Data Logging
       P      - Print Crossing Train Data Log
       Enter  - Return to previous menu or stop printing
```


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Display Train Data Log

To display the Train Data Log, enter P at the prompt and press ENTER.

```
Enter Selection >> P



IWP Crossing Train Data Log               10-15-04    09:42:32

TEST RACK

APPLICATION INFORMATION
     NAME            SingleApp EPROM
     EPT CRC         27B3
     EPT Checksum    3CF8

!!!!!!!!!!!!!!!!!!!!!!!! NOTE !!!!!!!!!!!!!!!!!!!!!!!!
    VALUES ARE SHOWN FOR MAINTENANCE PURPOSES ONLY.
    THEY ARE NOT USED IN WARNING TIME CALCULATIONS.
  REFER TO EVENT LOG FOR ACCURATE SEQUENCE OF EVENTS.
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

                  ISL      MDR          AUX          RSO          AP
                                  111          111          111          111 Track1
 Date   Time   1234 123456789012 123456789012 123456789012 123456789012     RX  PH
-------- -------- ---- ------------ ------------ ------------ ------------ --- -- --- -- --- -- --- --
10-15-14 09:34:37 1... 0........... ............ ............ ............  44 78 ... .. ... .. ... ..
10-15-14 09:34:36 1... 0........... ............ ............ ............  45 78 ... .. ... .. ... ..
10-15-14 09:34:36 1... 0........... ............ ............ ............  46 78 ... .. ... .. ... ..
10-15-14 09:34:36 1... 0........... ............ ............ ............  46 78 ... .. ... .. ... ..
10-15-14 09:34:35 1... 0........... ............ ............ ............  47 77 ... .. ... .. ... ..
```

System Event Log Menu

The System Event Log records the current state of any configured ISL, MDR, AUX, RSO or AP status when any of these changes. It also records the current value for RX and phase of each configured approach track circuit.

The System Event Log records the last 4000 system event state changes for specified application record table statuses (specified via the application program).

For each state change in the record table statuses, the System Event Log records the following:

- Indication of the date/time when the status change occurred
- Current RX for approach tracks (crossing configuration)
- Current Phase for approach tracks (crossing configuration)
- The current state of all specified Record Table statuses

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The above information is recorded for each of the following:

1) Track RX
2) Track Phase
3) Train Speed
4) Track Island
5) MDR Output Statuses
6) AUX Input Statuses
7) RSO Input Status
8) Advance Preempt Input Statuses

To display the System Event Log Enable/Disable menu, enter SE at the prompt and press ENTER.

```
Crossing Logs Menu
       NAME   - Change unit name ()
       TR     - Train Record Log Menu
       TD     - Train Data Log Menu
       SE     - System Event Log Menu
       RT     - Real Time Memory Log Menu
       RS     - Ring Status Log Menu
       CS     - Crossing System Setup
       ZX     - Zap Crossing Log menu
       Enter  - Return to previous menu

Enter Selection >> SE

Crossing Event Log Menu
       E      - Enable Live Crossing Event Logging
       *D     - Disable Live Crossing Event Logging
       P      - Print Crossing Event Log Enter - Return to previous menu or
```

Enable System Event Logging

To enable System Event Logging, enter E at the prompt and press ENTER.

```
Enter Selection >> SE

Crossing Event Log Menu
       *E     - Enable Live Crossing Event Logging
       D      - Disable Live Crossing Event Logging
       P      - Print Crossing Event Log
       Enter  - Return to previous menu or stop printing
```

Disable System Event Logging

To disable System Event Logging, enter D at the prompt and press ENTER.

```
Enter Selection >> SE

Crossing Event Log Menu
       *E     - Enable Live Crossing Event Logging
       D      - Disable Live Crossing Event Logging
       P      - Print Crossing Event Log
       Enter  - Return to previous menu or stop printing
```


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Display System Event Logging

To display the System Event Log, enter P at the prompt and press ENTER.

```
Crossing Event Log Menu
     *E       - Enable  Live Crossing Event Logging
      D       - Disable Live Crossing Event Logging
      P       - Print Crossing Event Log
      Enter   - Return to previous menu or stop printing

Enter Selection >> P



IWP Crossing System Event Log                10-15-14    09:41:56

TEST RACK

APPLICATION INFORMATION
     NAME            SingleApp EPROM
     EPT CRC         27B3
     EPT Checksum    3CF8

                  ISL      MDR          AUX          RSO          AP
                                  111          111          111          111 Track1
 Date   Time   1234 123456789012 123456789012 123456789012 123456789012     RX  PH
-------- -------- ---- ------------ ------------ ------------ ------------ --- -- --- -- --- -- --- --
10-15-14 09:35:11 1... 1........... ............ ............ ............  99 67 ... .. ... .. ... ..
10-15-14 09:34:57 0... 0........... ............ ............ ............   1 90 ... .. ... .. ... ..
10-15-14 09:34:31 1... 0........... ............ ............ ............  56 76 ... .. ... .. ... ..
10-15-14 09:29:57 1... 1........... ............ ............ ............  89 90 ... .. ... .. ... ..
10-15-14 09:29:43 0... 0........... ............ ............ ............   1 90 ... .. ... .. ... ..
```

Ring Status Log Menu

Each time an MDR status goes false, the PMD-4 generates a Ring Status Log entry to provide information about what caused the MDR to go false.

The Ring Status Log records the last 450 MDR state changes from TRUE to FALSE.

```
Crossing Logs Menu
       NAME   - Change unit name ()
       TR     - Train Record Log Menu
       TD     - Train Data Log Menu
       SE     - System Event Log Menu
       RT     - Real Time Memory Log Menu
       RS     - Ring Status Log Menu
       CS     - Crossing System Setup
       ZX     - Zap Crossing Log menu
       Enter  - Return to previous menu

Enter Selection >> RS

Crossing Ring Status Log Menu
       E      - Enable Live Ring Status Logging
       *D     - Disable Live Ring Status Logging
       P      - Print Ring Status Log
       H      - Print Ring Status Help
       Enter - Return to previous menu or stop printing
```

Enable Ring Status Logging

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To enable Ring Status Logging, enter E at the prompt and press ENTER.

```
Enter Selection >> RS

Crossing Ring Status Log Menu
       E      - Enable Live Ring Status Logging
       *D     - Disable Live Ring Status Logging
       P      - Print Ring Status Log
       H      - Print Ring Status Help
       Enter - Return to previous menu or stop printing
```

Disable Ring Status Logging

To disable Ring Status Logging, enter D at the prompt and press ENTER.

```
Enter Selection >> RS

Crossing Ring Status Log Menu
       E      - Enable Live Ring Status Logging
       *D     - Disable Live Ring Status Logging
       P      - Print Ring Status Log
       H      - Print Ring Status Help
       Enter - Return to previous menu or stop printing
```

Display Ring Status Help

To display the legend for the Ring Status Log, enter H at the prompt and press ENTER.

```
Crossing Ring Status Log Menu
      E       - Enable  Live Ring Status Logging
     *D       - Disable Live Ring Status Logging
      P       - Print Ring Status Log
      H       - Print Ring Status Help
      Enter   - Return to previous menu or stop printing

Enter Selection >> H

Ring Status Bit Legend
 • - DONT RING FALSE              25 - CW MODE                      49 - RX74 PH60 MD OVERRIDE TIMER
 • - AUX                          26 - MD MODE                      50 - FALSE SHUNT SEQUENCE
 • - RSO                          27 - RSO MODE                     51 - FALSE SHUNT TIMER
 • - ADVANCE PREEMPT (AP)         28 - MIN WT MODE                  52 - FALSE SHUNT CONDITION
 • - PRIMARY TTC <= WT            29 - SUDDEN SHUNT ZONE COND OVRD 53 - RESISTIVE SHUNT CONDITION
 • - ECAP RING                    30 - RESISTIVE SHUNT COUNTER      54 - APPR RELEASE SEQUENCE
 • - SECONDARY TTC <= WT          31 - MD TIMER COUNTER             55 - APPR RELEASE TIMER
 • - XMIT DETECT TTC <= WT        32 - MD TIMER CONDITION           56 - APPR RELEASE CONDITION
 • - ZERO SPEED                   33 - RX74 PH60 COUNTER            57 - FUTURE EXPANSION
 • - WHEEL COUNT OVERRIDE (WCO)   34 - RX74 PH60 CONDITION          58 - XMIT CHECK FAULT
 • - OUTBOUND OVERRIDE (OBO)      35 - UNCOMP PH COUNTER            59 - XMIT CHECK SUB FAULT 1
 • - SUDDEN SHUNT OVERRIDE (SS0)  36 - UNCOMP PH CONDITION          60 - XMIT CHECK SUB FAULT 2
 • - ISLAND ASSIGN                37 - MD RESTART CONDITION         61 - FUTURE EXPANSION
 • - ISLAND PASSAGE               38 - SUDDEN SHUNT ZONE CONDITION  62 - REVERSE LEADS FAULT
 • - ISLAND RECOVERY              39 - POSITIVE START SEQUENCE      63 - DECREASING PHASE TIMER
 • - PSEUDO ISLAND                40 - POSITIVE START CONDITION     64 - DECREASING PHASE CONDITION
 • - SUDDEN UNSHUNT               41 - RX74 PH60 MD OVERRIDE        65 - XTI HEALTHY
 • - SUDDEN SHUNT                 42 - POST JOINT SEQUENCE          66 - XTI OPERATIONAL
 • - INBOUND MOTION               43 - POST JOINT IGNITED           67 - ECAP HIGH VARIANCE
 • - NEGATIVE MOTION              44 - POST JOINT CONDITION         68 - ECAP DRIFT
 • - MOTION HOLD                  45 - HIGH SIGNAL COUNTER          69 - RX < 10
 • - AP TIMED OUT                 46 - HIGH SIGNAL CONDITION        70 - AMPLITUDE < 16
 • - MDR DOWN MD MODE             47 - LOW PHASE COUNTER            71 - DISTANCE <= 200 FEET
 • - CW MD PARAMETER              48 - LOW PHASE CONDITION          72 - UNDEFINED PHASE
```

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Display Ring Status Log

To display the Ring Status Log, enter H at the prompt and press ENTER.

```
Crossing Ring Status Log Menu
        E   - Enable Live Ring Status Logging
        *D  - Disable Live Ring Status Logging
        P   - Print Ring Status Log
        H   - Print Ring Status Help
        Enter   - Return to previous menu or stop printing

Enter Selection >> P



IWP Crossing Ring Status Log                11-22-14    13:58:01

INT STATION 5

APPLICATION INFORMATION
     NAME            xingextapp
     EPT CRC         B199
     EPT Checksum    1C3E


!!!!!!!!!!!!!!!!!!!!!!!!!!!!NOTE!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
       VALUES ARE SHOWN FOR MAINTENANCE PURPOSES ONLY.
       THEY ARE NOT USED IN WARNING TIME CALCULATIONS.
       REFER TO EVENT LOG ACCURATE SEQUENCE OF EVENTS.
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!


                                                Ring Status
                          77766666 66666555 55555554 44444444 43333333 33322222 22222111 1111111
  Date     Time    MDR Trk 21098765 43210987 65432109 87654321 09876543 21098765 43210987 65432109 87654321
-------- --------  --- ---- -------- -------- -------- -------- -------- -------- -------- -------- --------
11-22-14 09:26:32  M01 T1  00000011 00000000 00000000 00000000 00000000 00000101 00000000 00000000 00000111
11-22-14 09:26:32  M02 T1  11110011 00000000 00000000 00000000 00000000 00000001 00000010 00011010 00000001
<<End of Data>>
```

Real Time Memory Log Menu

The Real Time Memory Log Menu is only used by GETGS Customer Support to diagnose field issues. This tool provides the capability to monitor certain internal system conditions and states during train moves through the crossing.

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Crossing System Setup

The PMD-4 displays the following items at the first of any Crossing System Setup information display via the DPC.

1) Title of log “PMD-4 Crossing System Setup”
2) Current date and time
3) Name of PMD-4 unit
4) Application SSM Flash Name
5) Name of Specific Application Selected (Blank if Single Application SSM)
6) Application EPT CRC/Checksum

For each configured approach track along with labels for each item, the following is displayed:

1. Approach Enable/Disable
2. MDR Mnemonics/Numbers for MDR Statuses associated with the approach track
3. Island Assignment Status Mnemonic
4. Master/Slave
5. If redundant XTI Modules then which module (Normal or Standby) is the active module
6. Normal/Short/Very Short setting
7. Highest Recorded RX / corresponding Phase
8. Lowest Recorded Phase / corresponding RX
9. Frequency
10. Approach Length
11. LIA
12. TC
13. Gain
14. Unidirectional or Bi-directional
15. LOS
16. Ballast Compensation
17. Phase Compensation
18. False Shunt Settings
19. Approach Release Settings
20. Auto RX
21. Shunt Test Mode

For each configured MDR Status with labels for each item, the following is displayed:

1. MDR Status Number and Mnemonic
2. Requested Warning Time
3. CW/MD Mode
4. AUX Recovery Delay Time
5. Advanced Preempt Time

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For each configured Island Track Circuit with labels for each item, the following is displayed:

1. Island Number and Island Cleared Mnemonic
2. Enable/Disable
3. Island Frequency
4. LOS Count Setting
5. Fault Delay Setting
6. Gain
7. If redundant XTI Modules then which module (Normal or Standby) is the active module

To display the System Event Log Enable/Disable menu, enter CS at the prompt and press ENTER.

```
Crossing Logs Menu
       NAME   - Change unit name ()
       TR     - Train Record Log Menu
       TD     - Train Data Log Menu
       SE     - System Event Log Menu
       RT     - Real Time Memory Log Menu
       RS     - Ring Status Log Menu
       CS     - Crossing System Setup
       ZX     - Zap Crossing Log menu
       Enter  - Return to previous menu

Enter Selection >> CS

PMD-4 Crossing Setup Log                        10-12-14     16:43:21


APPLICATION INFORMATION
       NAME                xingextapp
       EPT CRC             E5C7
       EPT Checksum        1C41

APPROACH SETTINGS


                           Track 1      Track 2      Track 3      Track 4
                      ------------ ------------  ------------  ------------

Approach Enable/Disable:   Enabled      Enabled       Enabled       Enabled

       MDR Mnemonic(01):      M1           -             -             -
       MDR Mnemonic(02):      M2           -             -             -
                                          .
                                          .
                                          .
```

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Zap Crossing Log Menu

The capability to erase the following logs is provided through the Zap Crossing Log Menu display.

To display the Zap Crossing Log menu, enter ZX at the prompt and press ENTER.

```
Crossing Logs Menu
       NAME   - Change unit name ()
       TR     - Train Record Log Menu
       TD     - Train Data Log Menu
       SE     - System Event Log Menu
       RT     - Real Time Memory Log Menu
       RS     - Ring Status Log Menu
       CS     - Crossing System Setup
       ZX     - Zap Crossing Log menu
       Enter  - Return to previous menu

Enter Selection >> ZX

Erase Crossing Log commands
       TR     - Erase Train Record Log
       TD     - Erase Train Data Log
       SE     - Erase System Event Log
       RS     - Erase Ring Status Log
```

Erase Train Record Log

To erase the Tranin Record Log, enter TR at the prompt and press ENTER.

```
TR

10-15-14 08:02:13 Log Erased By User
Train Record Log Erased
```

Erase Train Data Log

To erase the Train Data Log, enter TD at the prompt and press ENTER.

```
TD

Train Data Log Erased
```

Erase System Event Log

To erase the System Event Log, enter SE at the prompt and press ENTER.

```
SE

Recorder/Data log erased
```

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Erase Ring Status Log

To erase the Ring status log, enter RS at the prompt and press ENTER.

```
RS

Ring status log erased
```

Erasing All Crossing Logs

To erase all crossing logs, enter ALL at the prompt and press ENTER.

```
ALL

Train Data Log Erased

Recorder/Data log erased

10-15-14 08:02:31 Log Erased By User
Train Record Log Erased

Erase Crossing Log commands
       TR     - Erase Train Record Log
       TD     - Erase Train Data Log
       SE     - Erase System Event Log
       ALL    - Erase All Logs
```

Zap (Erase) Logs/Alarms

Use the Zap Commands to erase recorded data. To display the Zap Commands Help screen, type Z and press the ENTER key.

```
Z

Zap Commands
  ZA          - Erase Alarms
  ZD          - Erase Data Log
  ZE          - Erase Error Log
```

Zap Commands Help Screen.

ZA - Erase Alarms

This command erases the alarms. To erase the Alarms, type ZA and press the ENTER key.

```
ZA

Alarm history erased
```

Erase Alarms Screen.

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ZD - Erase Data Log

This command erases all the data in the Data Log. To erase the Data Log, type ZD and press the ENTER key.

```
ZD

Recorder/Data log erased
```

Erase Recorder/Data Log Screen.

ZE - Erase Error Log

This command erases all the data in the Error Log. To erase the Error Log, type ZE and press the ENTER key.

```
ZE

Error Log Erased - Soft Erase
```

Erase Error Log Screen.

Chapter 9 – Retest Guide

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Chapter 9 – Retest Guide

General

WARNING *Retest procedures should be performed before the unit is placed into service and in accordance with standard railroad, FRA, and/or other regulatory agency rules. The tests should be performed by qualified personnel that have the knowledge to correctly and safely discharge the tests. Failure to adequately test the PMD-4unit after the initial setup could result in death or serious injury. Reference SRAC2.*

WARNING *No information in this section supersedes or replaces your railroad's operating rules. If there is a difference in instructions between this manual and the railroad's operating rules, follow the most restrictive instruction. Reference SRAC2.*

WARNING *These procedures may interfere with the operation of the signal system. Before interfering with the signal system, obtain permission from the dispatcher or other authority (per the operating rules of your railroad). Reference SRAC2.*

This chapter provides a guideline of the minimum retesting that GE Transportation Global Signaling recommends be performed after:

- An in-service PMD-4that has been modified (module or software change),
- An PMD-4has been setup after a "Default All" operation,
- Maintenance has occurred on the track.

These recommendations are based on system safety requirements, as well as practices to ensure proper system operation and reliability. These recommendations do not supersede FRA or railroad testing requirements, and do not represent the policy of any railroad signal department, unless adopted as such. Refer to your railroad's signal department policy for guidance.

When multiple modules are changed within the PMD-4system, the retesting should include the combined total recommendations for each of the modules changed.

PMD-4 was designed with diagnostics as an integral part of its design. Before performing any testing to the PMD-4 system, verify that each of the module health LEDs are lit, that the CDU displays the "PMD-4 HOME MENU" message, and that there are no alarm messages displayed on the CDU. If any error conditions exist, complete troubleshooting of the PMD-4 before performing this retest procedure.

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Application Software Changes

Note: *When changing the Application program, the PMD-4 System will automatically delete the existing data logs due to changes in application recorder information. Print or download all data log information prior to changing the existing application program.*

Same Application SSM - Different Application Program

1. Select new application program from WebGUI or CDU from factory installed SSM and preloaded application program.

2. Set the Chassis ID to the new value used in the application or to zero(0 is default) if not used. The PMD-4 system will save the value and reset.

3. Select the desired application program and verify the CRC and checksum information displayed is as expected.

4. Verify that all the health LEDs are illuminated and that no alarm messages are displayed on the CDU.

5. Perform a Default All Crossing Parameter operation.

6. Verify and enter, as required, all configuration information including:
   - Crossing Parameters
   - Crossing Controller Parameters
   - Vital Configuration Settings
   - Vital Timer Values
   - Diagnostic and Vital Communication Port settings

7. Calibrate the approach track.

8. Calibrate the Island.

9. Perform a full checkout as if installing a new PMD-4 system.

10. Retest Wireless Crossings behavior per the Retest Chapter in the GE Wayside Wireless Crossings Controller document (100323-008).

New Application SSM – Different Application Program

When changing to a new or different SSM with a newer revision application program or different application program, perform the following steps.

1. Start with the PMD-4 power switch in the OFF position.
2. Remove the old SSM and add the new SSM module to the PMD-4 chassis.
3. Turn the PMD-4 ON and verify that the system starts without error and the alarm messages displayed on the CDU or WebGUI is Application Selection Required, Chassis ID not set and Chassis ID/SSM mismatch alarms. Note the Chassis ID is set to *** when the default application is loaded.
4. Set the Chassis ID to the value used in the application or to zero(0 is default) if not used. The PMD-4 system will save the value and reset.
5. Select whether the SSM or PMD-4 Chassis is being replaced in the CDU or WebGUI application selection page. Select “Replaced SSM”.
6. Select the desired application program and verify the CRC and checksum information displayed is as expected.
7. Verify that all the health LEDs are illuminated and that no alarm messages are displayed on the CDU.
8. Perform a Default All Crossing Parameter operation.
9. Verify and enter, as required, all configuration information including:
   - Crossing Parameters
   - Crossing Controller Parameters
   - Vital Configuration Settings
   - Vital Timer Values
   - Diagnostic and Vital Communication Port settings
10. Calibrate the approach track.
11. Calibrate the Island.
12. Perform a full checkout as if installing a new PMD-4 system.
13. Retest Wireless Crossings behavior per the Retest Chapter in the GE Wayside Wireless Crossings Controller document (100323-008).

New Application SSM – Same Application Program

There are times when it is desirable to change application SSMs but continue to use the same application program. A few examples are:

- A single application SSM is being upgraded to a multiple application SSM in an effort to standardize
- When upgrading to a new revision of Multiple Application SSM but the given application at the site is not changing
- When troubleshooting a problem and the SSM is at fault or at least suspect.

When changing SSM's on PMD-4 systems with the same application program for multiple PMD-4 platforms, perform the following steps.

1. Start with the PMD-4 power switch in the OFF position.
2. Remove the old SSM and add the new SSM module to the PMD-4 chassis.
3. Turn the PMD-4 ON and verify that the system starts without error and the alarm messages displayed on the CDU or WebGUI is Application Selection Required and Chassis ID/SSM mismatch alarms.
4. Enter the Chassis ID/SSM mismatch menu of the CDU or WebGUI application page and enter which is being changed either the SSM or PMD-4 Chassis. Select "Replaced SSM".
5. Select the desired generic application program and verify the CRC and checksum information displayed is as expected.
6. Label the SSM modules according to this generic use.
7. Verify that all the health LEDs are illuminated and that no alarm messages are displayed on the CDU.

New PMD-4 Chassis – Same SSM & Application Program

There are times when it is desirable to change PMD-4 systems but continue to use the same application program.

When changing a PMD-4 Chassis with the same application program, perform the following steps.

1. Start with the PMD-4 power switch in the OFF position.
2. Remove the old Chassis and add the new Chassis with the SSM module with desired working application.
3. Turn the PMD-4 ON and verify that the system starts without error and the alarm messages displayed on the CDU or WebGUI is Application Selection Required, Chassis ID not set and Chassis ID/SSM mismatch alarms. Note the Chassis ID is set to *** when the default application is loaded.
4. Set the Chassis ID to agree with the value set in the application(default is 0). The PMD-4 system will save the value and reset.
5. Enter the Chassis ID/SSM mismatch menu of the CDU or WebGUI application selection page and enter which is being changed either the SSM or PMD-4 Chassis. Select "Replaced PMD4".

6. Select the desired generic application program and verify the CRC and checksum information displayed is as expected.

7. Verify that all the health LEDs are illuminated and that no alarm messages are displayed on the CDU.

Executive Software Changes

Note: *Prior to changing the PMD-4 Executive Software, print or download the system log files (data log, configuration log, error log) that are stored in non-volatile memory inside the PMD-4 System.*

1. Start with the PMD-4 power switch in the OFF position. Turn the PMD-4 ON and verify the system starts without error, all health LEDs are illuminated, and that no alarm messages are displayed on the CDU or Web GUI .

2. Using the CDU or Web GUI, select the Modules Menu and verify the executive software revisions of the A, B and C processors are the same or greater revisions than those that are being replaced. Update the site documentation with the latest information.

3. Additional tests should also be performed to verify that the vital configuration switches (and Chassis ID if applicable) are set correctly.

4. For each crossing approach track, verify that (with a clear approach) the RX value is between 105 and 95 (Auto RX enabled) and ensure that the RX value is stable (+ or- one digit). Recalibrate the approach if needed.

5. For each Island, verify that (with a clear Island) the Island LED is illuminated. Recalibrate the Island if needed.

6. Observe a single train move through the crossing or if no train is available, place a 0.06 ohm shunt in the crossing island for one minute and observe the crossing warning system remains active. When PMD-4 operation is tested using a 0.06 ohm shunt in the crossing island, it is recommended that the system warning time be confirmed at the next practical interval.

7. Retest Wireless Crossings behavior per the Retest Chapter in the GE Wayside Wireless Crossings Controller document (100323-008).

PMD-4 System Retest Checkout

1. Start with the PMD-4 power switch in the OFF position. Turn the PMD-4 ON and verify the system starts without error, all health LEDs are illuminated, and that no alarm messages are displayed on the CDU or Web GUI .

2. Verify the PMD-4 health LED is illuminated on the CDU panel.

3. Verify the CDU display and pushbuttons are functioning.

4. For the PMD-4 Supervisory function checkout:

   a) Using the CDU or a diagnostic port computer, select the Modules Menu and verify the executive software revisions of the A, B and C processors are the same or greater revisions than those that are being replaced. Update the site documentation with the latest information.

   b) For each crossing approach track, verify that (with a clear approach) the RX value is between 105 and 95 (Auto RX enabled) and ensure that the RX value is stable (+ or- one digit). Recalibrate the approach if needed.

c) For each Island, verify that (with a clear Island) the Island LED is illuminated. Recalibrate the Island if needed.

d) Observe a single train move through the crossing or if no train is available, place a 0.06 ohm shunt in the crossing island for one minute and observe the crossing warning system remains active. When PMD-4 operation is tested using a 0.06 ohm shunt in the crossing island, it is recommended that the system warning time be confirmed at the next practical interval.

e) For the VIO-44S I/O module, exercise the system to verify the system will properly respond with the I/O in its most permissive state (energized), and in its most restrictive state (de-energized):

- Vital inputs (Verify the system responds to each utilized vital input in its energized state, and in its de-energized state.)

- Vital outputs (Verify that the system can properly energize and de-energize each utilized vital output used.

f) For the PMD-4 XTI-1S Crossing Track Interface, exercise the following:

- With an unoccupied approach, verify the replaced XTI-1S approach track circuit exhibits RX=100. If it does not, re-calibrate that approach track circuit. With an unoccupied island, verify the island LED on the replaced XTI-1S is illuminated. If it is not, re-calibrate that island track circuit.

- Using the CDU verify all of the setup parameters are still correctly set under the Crossing Approach Setup and Crossing Island Setup menus.

- Shunt-test the approach and island track circuits in accordance with the policies of your railroad. If applicable, verify that the crossing activates with a shunt in the island.

g) For Vital Communication Links (if utilized), verify the system properly generates and responds to vital communication statuses in both their permissive and restrictive states.

h) If a laptop computer is available, check the recorder data log to ensure it is functioning properly.

i) Retest Wireless Crossings behavior per the Retest Chapter in the GE Wayside Wireless Crossings Controller document (100323-008).

PMD-4R System Retest Checkout

1. Start with the PMD-4R power switch in the OFF position. Turn the PMD-4R ON and verify the system starts without error, all health LEDs are illuminated, and that no alarm messages are displayed on the CDU or Web GUI .

2. Verify the PMD-4R health LED is illuminated on the CDU panel.

3. Verify the CDU display and pushbuttons are functioning.

4. For the PMD-4R Supervisory function checkout:

   a) Using the CDU or a diagnostic port computer, select the Modules Menu and verify the executive software revisions of the A, B and C processors are the same or greater revisions than those that are being replaced. Update the site documentation with the latest information.

b) For each crossing approach track, verify that (with a clear approach) the RX value is between 105 and 95 (Auto RX enabled) and ensure that the RX value is stable (+ or- one digit). Recalibrate the approach if needed.

c) For each Island, verify that (with a clear Island) the Island LED is illuminated. Recalibrate the Island if needed.

d) Observe a single train move through the crossing or if no train is available, place a 0.06 ohm shunt in the crossing island for one minute and observe the crossing warning system remains active. When PMD-4 operation is tested using a 0.06 ohm shunt in the crossing island, it is recommended that the system warning time be confirmed at the next practical interval.

j) For the VIO-44R I/O module, exercise the system to verify the system will properly respond with the I/O in its most permissive state (energized), and in its most restrictive state (de-energized):

- Vital inputs (Verify the system responds to each utilized vital input in its energized state, and in its de-energized state.)
- Vital outputs (Verify that the system can properly energize and de-energize each utilized vital output used.
- Force a switchover to the alternate bank in the pair, verify all health LEDs are illuminated and no alarm messages are displayed by the CDU.

k) For the PMD-4R XTI-1S Crossing Track Interface, exercise the following:

- With an unoccupied approach, verify the replaced XTI-1S approach track circuit exhibits RX=100. If it does not, re-calibrate that approach track circuit. With an unoccupied island, verify the island LED on the replaced XTI-1S is illuminated. If it is not, re-calibrate that island track circuit.
- Using the CDU verify all of the setup parameters are still correctly set under the Crossing Approach Setup and Crossing Island Setup menus.
- Shunt-test the approach and island track circuits in accordance with the policies of your railroad. If applicable, verify that the crossing activates with a shunt in the island.

l) For the PMD-4R NSM-1 (Normal/Standby) Interface, exercise the following:

- For each Normal/Standby module pair, perform a forced switchover operation or remove the Normal (active) module to initiate a failover to the Standby (inactive) module. Verify:
  - the system switches/fails over without error
  - all health LEDs are illuminated
  - that no alarm messages are displayed on the CDU.
- Again, initiate a switchover or failover for each Normal/Standby module pair shifting operations back to the Normal modules.

m) For Vital Communication Links (if utilized), verify the system properly generates and responds to vital communication statuses in both their permissive and restrictive states.

n) If a laptop computer is available, check the recorder data log to ensure it is functioning properly.

o) Retest Wireless Crossings behavior per the Retest Chapter in the GE Wayside Wireless Crossings Controller document (100323-008).

Following Track Maintenance

1) If the crossing has been out of service for greater than 24 hours prior to the module change, verify that no visible changes have occurred causing shunt conditions (rust, film on rail, etc.) to deteriorate (shunt greater than 0.06 ohms within the PMD-4 approaches).

2) For each crossing approach track, verify that (with a unoccupied approach) the RX value is between 105 and 95 (Auto RX enabled) and ensure that the RX value is stable (+ or - one digit). Recalibrate the approach if needed.

3) For each Island, verify that (with a unoccupied Island) the Island LED is illuminated. Recalibrate the Island if needed.

4) If the approach termination shunts were moved or any equipment was added or removed from the approaches, perform an Lump Impedance Adjustment (LIA) on the approach.

5) Observe a single train move through the crossing or if no train is available, place a 0.06 ohm shunt in the crossing island for one minute and observe that the crossing warning system remains active. When PMD-4 operation is tested using a 0.06 ohm shunt in the crossing island, it is recommended that the system warning time be confirmed at the next practical interval.

Following a Default All Crossing Parameter Operation

1) Using the CDU or a diagnostic port computer, verify and enter as required, all configuration information from the circuit plans including:
   - Crossing parameters
   - Vital Configuration Settings (vital soft switches)
   - Vital Timer Values
   - Office, Diagnostic and Vital Communication Port settings

2) Calibrate the Approach Track.

3) Calibrate the Island.

4) Perform a full checkout as if installing a new PMD-4 system.

Annual Warning Time Retest Procedures

The purpose of this procedure is to provide a method for reducing the time and effort needed to perform the required FRA annual warning time tests. This is accomplished by identifying all critical site specific switch and adjustment settings, which can affect warning time, and assigning a single comprehensive CRC value hereafter called the Warning Time CRC (WT CRC). The process of accomplishing this is to initially setup, test and document the operation of the warning system. When testing has been satisfactorily completed, a Warning Time CRC value is generated from the combined internal settings of the PMD-4 for the specific site. The resulting unique Warning Time CRC number simplifies the verification of all of these settings.

This Warning Time CRC can be compared to later inspections to determine, conclusively, if any site specific setting has been changed since the unit was last operationally verified and documented. . If the two numbers agree, it is certain that no critical PMD-4 parameters have been changed that would affect warning time. Provided that the Warning Time CRC and additional display values specified below match their recorded values within specified limits, the unit can be safely recertified.

The following verification form specifies the items that should be checked to verify the warning time periodically after initial installation. Base testing values should be captured upon initial installation or upon recertification of warning time operation. Mark any not applicable items as NA. If the values differ from the specified ranges, then the original process of initial setup, test, and documentation should be performed.

Periodic Warning Time Test Form For PMD-4/4R						
Location						
Equipment	**Parameter**	**Parameters to Verify**	**Type of Setting**	**Base testing values**	**Current test - Normal Units**	**Current test - Standby units**
PMD-4/4R	RX	RX is within 95 to 105 (91 to 109 if Auto RX is disabled) and is stable +/- one digit.	Displayed value			
	Site Specific Parameters	Verify the Warning Time CRC value from the CDU or web GUI matches base testing value as recorded on the Grade Crossing Location Record form.	Display Value			
	External Wiring	Activate the crossing then verify the crossing warning devices all operate as intended.	NA			NA
	Remote Starts	Verify that the remote start control activates all crossing warning devices as intended.	NA			NA

Chapter 9 – Specifications

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PMD-4/4RSystem Specifications

Figure 8-1 PMD-4 Dimensions

Dimensions

Maximum Overall Height	**A**	10.5 “
Distance Between Mounting Holes	**B**	9”
Depth	**C**	8”
Width	**D**	13”

Environmental

Operating Temperature	-40E to +70E C
Storage Temperature	-55E to +85E C
Relative Humidity	20-95% (non-condensing)
Surge Protection	MDSA-1/-1XS or MDSA-2/-2XS

Power Specifications

Battery Input Voltage	9.5 to 16.5 Vdc
Allowable ripple	Up to 2Vac peak to peak
Current Draw	Maximum current draw can be calculated per PMD-4/PMD-4R system by adding the total maximum Power Consumption for each module, in Watts, installed in the system (with the exception of the CPS) per the specifications for each module. Dividing the total number of watts by 12 Vdc gives the maximum current draw for the PMD4/PMD-4R system as configured.
PMD-4 Power Consumption:	20.25 Watt maximum (no outputs) 41.5 Watts maximum (all outputs at max. load)
PMD-4R Power Consumption:	26.75 Watt maximum (no outputs) 81.5 Watts maximum (all outputs at max. load)

Fusing: Power Supply Fusing(10 Amp, 7.5 Amp, 6 Amp),

Operational Specifications

CDU Interface

4 line x 20 character OLED
4 x4 keypad
5 button navigation keypad
2 Ethernet 10/100 Mbps
17 Diagnostic Multi-Color LED Readout(PMD-4), 20 Diagnostic Multi-Color LED Readout(PMD-4R).

XTI-1S Track Circuit Specification:

Approach Track Circuit:	86Hz - 979Hz (28 frequencies) 250 ft.- 7,500 ft. (depending on ballast)
Island Track Circuit:	4KHz - 8KHz (9 frequencies) 100 ft. - 400 ft.
Master/Slave:	Compatible with ElectroLogIXS XP4, HXP, and PMD products
60 Hz Rejection:	Up to 15Vrms for all operating frequencies

VIO-44S/44R Circuit Specification:

Input Voltage:	0 to 18 Vdc, #12 AWG, 2 wire
Output Voltage:	9.0 to 16.5 Vdc, #12 AWG, 2 wire

PMD-4/4RModule Specifications

SSM module: 64 Mbit(PN 227758-000) or 256 Mbit(PN 227779-001)Serial Flash.

Appendix A – Acronym List

Contents

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Appendix A – Acronym List

Acronym List

AC	**Alternating Current**
ACE	**Application Compiler Editor**
AP	**Advance Preempt**
ATC	**Approach Track Circuit**
AUX	**Auxiliary**
AWG	**American Wire Gauge**
CD	**Compact Disc**
CDU	**Control Display Unit**
CI	**Chassis Information Module**
CIO	**Communications Input/Output**
CJ-LOS	**Clear Joint Loss of Shunt**
CPS	**Central Power Supply**
CPU	**Central Processing Unit**
CWE	**Constant Warning Enable**
DC	**Direct Current**
DIP	**Dual In-line Package**
EIXS	**ElectroLogIXS**
EPROM	**Erasable Programmable Read Only Memory**
FSS	**Frequency Selectable Shunt**
GUI	**Graphical User Interface**
HXP	**Highway Crossing Processor**
ID	**Identification**
IJ-LOS	**Insulated Joint Loss of Shunt**
ISL	**Island**
ITC	**Island Track Circuit**
IXC	**Integrated Crossing Controller**
LAN	**Local Area Network**
LIA	**Lumped Impedance Adjustment**
LCP	**Local Control Panel**
LED	**Light Emitting Diode**
LOS	**Loss of Shunt**
MDR	**Motion Detector Relay**
MDSA	**Motion Detector Surge Arrestor**
MPH	**Miles per Hour**
NBS	**Narrow Band Shunt**
NSM	**Normal Standby Module**
PJ-DET	**Post Joint Detection**

PMD	**Phase Motion Detector**
RSI	**Random Signature Island**
SSM	**Site Specific Module**
TIU	**Track Isolation Unit**
TJC	**Tunable Joint Coupler**
VIO	**Vital Input/Output**
VPM	**Vital Peripheral Master**
WAN	**Wide Area Network**
WBS	**Wide Band Shunt**
XCI	**Crossing Chassis Information Module**
XIP	**Crossing Interface Panel**
XTI	**Crossing Track Interface Module**

Appendix B – Ethernet / IP Application Guidelines

Contents

Direct Computer to ElectroLogIXS or PMD-4/4R IP Connection . . . . . .
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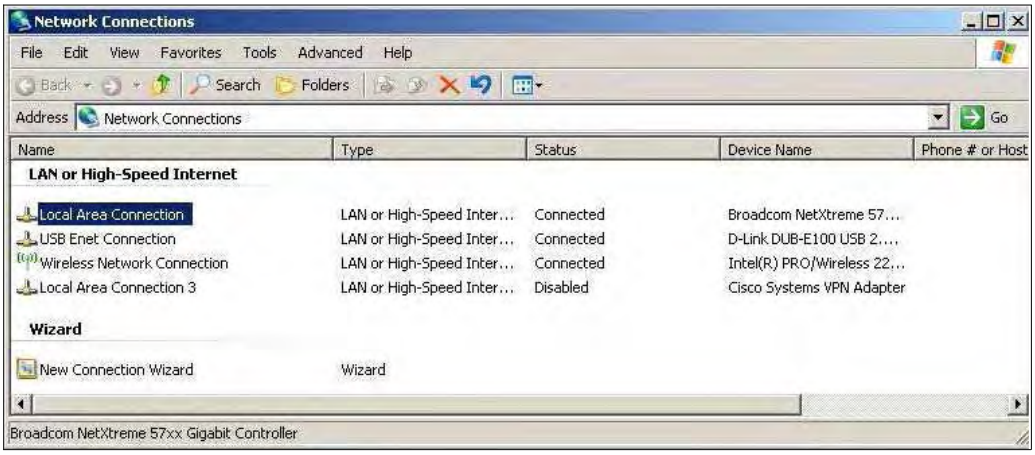
Appendix B – Ethernet / IP Application Guidelines

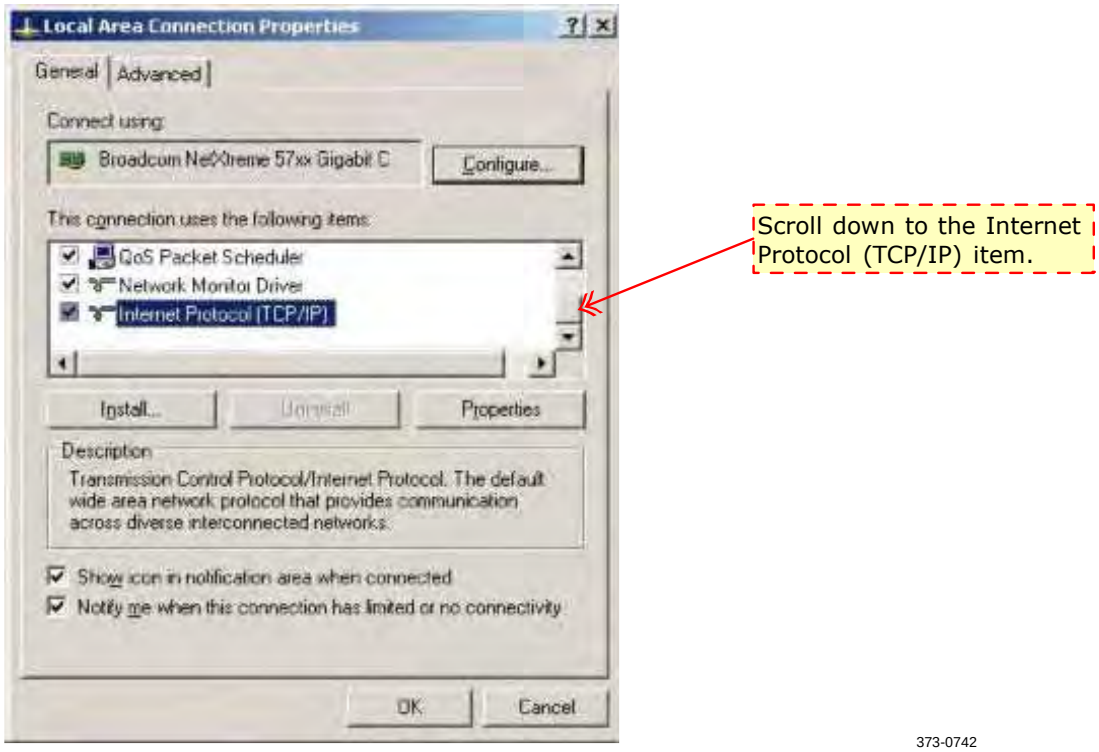
Direct Computer to ElectroLogIXS or PMD-4/4R IP Connection

Establishing the IP address and subnet mask are necessary before a device (e.g. laptop computer, PDA, etc.) can communication with the ElectroLogIXS or PMD-4/4R. If ElectroLogIXS or PMD-4/4R access is to be accomplished across a network, consult the network administrator for the proper settings. If Web GUI access is being done via a directly connected computer, it may be necessary to set the computer's IP address manually. To do so;

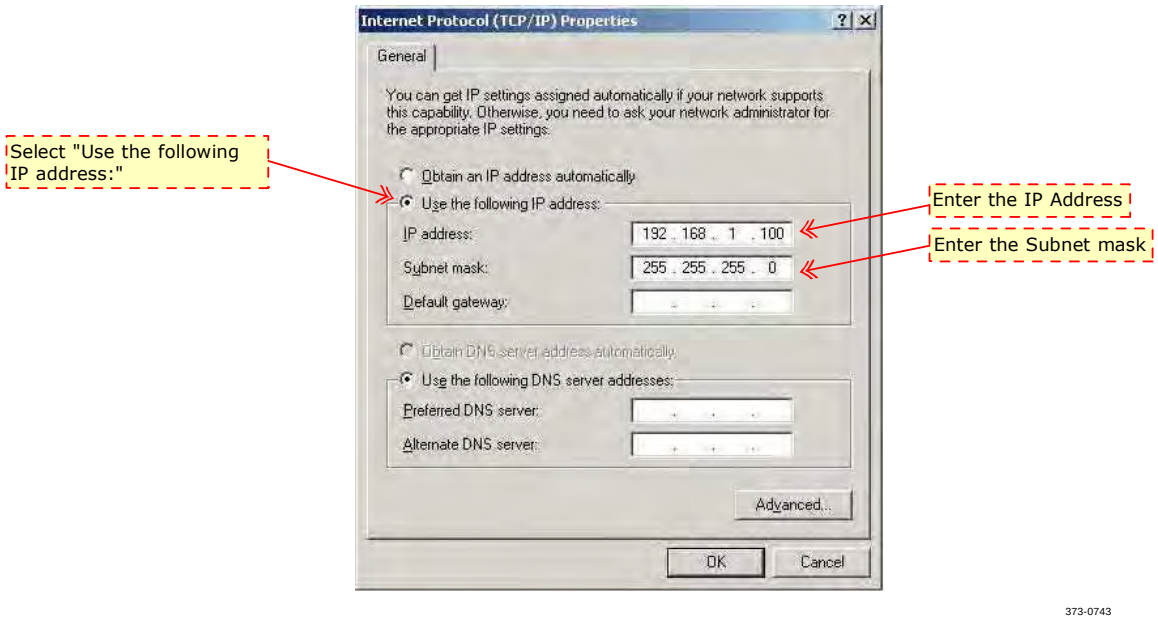
- Find the connection to be used under the Network Connections dialog (Start -> Settings -> Network Connections).


Network Connections
File Edit View Favorites Tools Advanced Help
Back Search Folders
Address Network Connections
Go
Name Type Status Device Name Phone # or Host
LAN or High-Speed Internet
Local Area Connection LAN or High-Speed Inter... Connected Broadcom NetXtreme 57...
USB Enet Connection LAN or High-Speed Inter... Connected D-Link DUB-E100 USB 2....
Wireless Network Connection LAN or High-Speed Inter... Connected Intel(R) PRO/Wireless 22...
Local Area Connection 3 LAN or High-Speed Inter... Disabled Cisco Systems VPN Adapter
Wizard
New Connection Wizard Wizard
Broadcom NetXtreme 57xx Gigabit Controller

- Highlight the connection, right-click and select properties. The Local Area Connection properties dialog box will appear.



- Scroll to the bottom of the properties window and highlight “Internet Protocol (TCP/IP). Select the Properties button.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 100
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel
Select "Use the following IP address:"
Enter the IP Address
Enter the Subnet mask
373-0743

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- Select “Use the following IP address” and enter the IP address for the computer. If directly connecting to the ElectroLogIXS or PMD-4/4R use an IP address that matches the ElectroLogIXS or PMD-4/4R IP address in all but the last number for the ElectroLogIXS or PMD-4/4R Ethernet port to be used for the connection. Use the same Subnet mask value as the ElectroLogIXS or PMD-4/4R. Click ‘OK.’ Note: The current value of the ElectroLogIXS or PMD-4/4R IP addresses are available on the CDU under the SYSTEM CONFIGURATION / Ethernet Config menu.

- Connect the computer to the ElectroLogIXS or PMD-4/4R Ethernet port via an Ethernet cable. Confirm that the Ethernet connection LED(s) are lit on the ElectroLogIXS or PMD-4/4R. If so, the computer should now be able to communicate with the ElectroLogIXS or PMD-4/4R.

Note: *Some configuration settings / configuration scripting in Internet Explorer may keep the browser from directly connecting to the ElectroLogIXS or PMD-4/4R IP addresses. Contact the network administrator if issues are encountered.*

- After the Web GUI session has completed, follow the above steps to return the computer IP settings to their original values.

Appendix C - System Timing Considerations

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System Timing Considerations

The following information is provided to allow determination of performance and response times for PMD-4/PMD-4R systems. For various configurations, a range of times is given as the asynchronous sampling and processing of inputs will cause a given unit to experience variation in response performance from one instance to the next.

The following time definitions are used to describe response performance:

Minimum Time	The fastest system response time for a given PMD-4/PMD-4R configuration
Typical Time	The nominal system response time for a given PMD-4/PMD-4R configuration. Statistically, the time value where 50% of the responses are expected to be faster than this time, and that 50% are expected to be slower.
Maximum Time	The longest system response time that is allowed by the PMD-4/PMD-4R operation. An output will either be produced within this time or the system will reset (producing a safe output).

PMD-4/PMD-4R Processing

The PMD-4/PMD-4R processing paradigm is depicted in Figure 1. When an input to either the vital processing or non-vital processors occurs, the input is filtered, conditioned, or otherwise verified in preparation for use by the application programs. After input verification, the application equations combine input values and produce the resulting outputs.

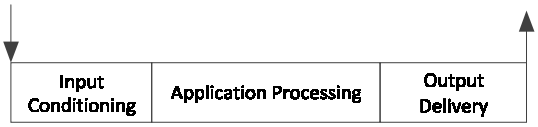

Figure 1, PMD-4/PMD-4R Processing

Variations in system response time can occur since the PMD-4/PMD-4R processing occurs in a cyclic fashion and external events are asynchronous to this cycle. The Input conditioning operates asynchronously from the Application Processing and Output Delivery phases (which are tied sequentially) to provide another source of response time variation. Operations that require processing by both the vital and non-vital processors, such as communication based office or vital remote I/O, experience the effects of the vital and non-vital processors operating asynchronously from one another as well.

The most significant factor in the variance and magnitude of response times in a single PMD-4/PMD-4R system is the application equation execution. This time is dependent upon the number of application equations, the type of equations (compressed or uncompressed format), and the degree of optimization in the equation execution order. A secondary factor in response time is the number and types of I/O modules in a given configuration. The maximum time is bounded as all application processing must be completed within 248 milliseconds on the vital processors and within 100 milliseconds on the non-vital processor.

Equation optimization has an effect on response time. Applications with a relatively moderate number of equations can require substantial processing time if the equation order requires multiple equation execution passes to stabilize. The Application Compiler Editor (ACE) has an equation ordering optimization capability that can reduce this factor on processing demand.

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The vital equation format (uncompressed or compressed) also influences the equation execution time. Compressed format equations require approximately 60% of the processing time that the same equations in uncompressed format require. The PMD-4/4R vital and non-vital processors are each able to execute 10,000 logic equations (vital equations in compressed format) that have an average size of six contacts per equation and that are able to stabilize (resolve) in seven equation execution passes. The Application Compiler Editor (ACE) determines an Equation Stability count value (number of equation execution passes) based on the number and size of the equations entered. The ACE help resource that is part of the ACE toolset provides instructions for modifying (increasing) the Equation Stability count based on the equation format chosen and the specifics of the unit I/O configuration.

System Response

The system response time tables in the following sections are constructed by depicting the various asynchronous processes that comprise the total response time. These asynchronous processes, typically, each have a response time range that is dependent upon the arrival time of the input to that process. For example, Figure 2 illustrates the process by which the voltage on an external input is sampled / filtered by the I/O module hardware.

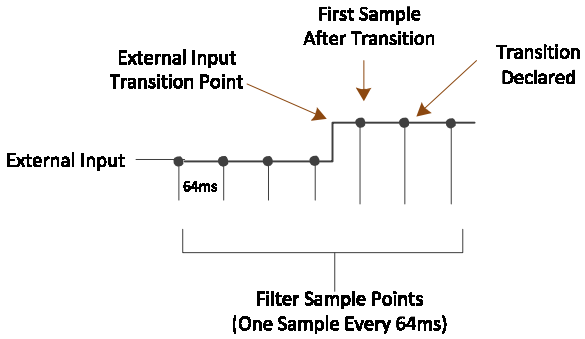

Figure 2, External Input Filtering Process

In order for the I/O module hardware to "detect" a low-to-high transition, the external input voltage must be above the defined voltage threshold for an entire 64ms sample period. Therefore, the range of low-to-high transition detection is 64ms (transition happens at the start of a period) to 128ms (transition happens just after the start of a period).

In addition to the initial detection time, use of Slow Pick or Slow Release times on vital discrete inputs introduces a source of timing variation. Specifically, Slow Pick or Slow Release times of less than 9 seconds are accurate to -0 / +1 second of the set time value. Time values that are 9 seconds or greater are accurate to -0 / +10% of the time value. The time tables below do not account for the use of Slow Pick or Slow Release times.

Similarly, the use of Vital Timers introduces variation in the processing performance. Specifically, Vital Timers of less than 4 seconds are accurate to -0 / +0.5 seconds of the set time value. Vital Timers of 4 seconds or longer are accurate to -0 / +10% of the timer value. The time tables below do not account for the use of Vital Timers in the equation processing.

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Single Unit Performance – Module I/O

Figure 3 depicts the response time measurement from a physical vital input activating to a physical output being activated due to the input on a single PMD-4/PMD-4R system. The table following the figure denotes the response time behavior for this scenario. Module I/O is handled entirely by the vital processors.

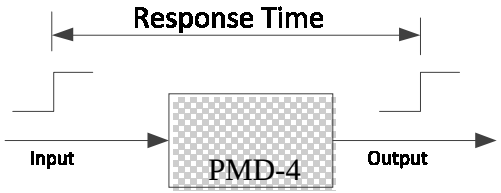

Figure 3, Single PMD-4/PMD-4R System, Module I/O

Processing Event		Response Time (ms)		
		Minimum	**Maximum**	**Typical (Nominal)**
1	VIO Input (Filtered Detection)	64	128	96
2	Input De-bounce	256	320	256
3	Vital Equation Processing & VIO Output Delivery	60	496	230
	TOTAL	**382**	**944**	**582**

The above response time is the expected performance for any of the I/O module output types in the PMD-4/PMD-4R. That is, a VIO output, a Lamp Output, the beginning of a Cab Rate output or ElectroCode code rate would experience the same response performance when triggered by a VIO input event.

Single Unit Performance – Communication Based I/O

Figure 4 depicts the response time measurement from a single unit receiving a communications based input (either a non-vital office protocol message or vital remote protocol message) to a physical output being activated due to the input. The table following the figure denotes the response time behavior for this scenario. The time starts after the arrival of the message and does not include message transmission time.

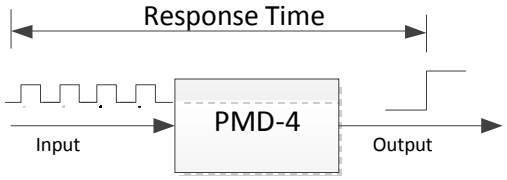

Figure 4, Single PMD-4/PMD-4R System, Communication Input, Module I/O Output

Processing Event		Response Time (ms)		
		Minimum	**Maximum**	**Typical (Nominal)**
1	Message processing by the Communications (non-vital) processor	10	200	50
2	Vital Message and Equation Processing & VIO Output Delivery	60	496	230
	TOTAL	**70**	**696**	**280**

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Figure 5 depicts the response time from a single unit that is transmitting a communication based output based on the activation of a physical module I/O input. The response time is measured from the input transition to the beginning of the message transmission and does not include message transmission time. If the communication is via a polled office protocol, then the poll period should be added to the maximum time, zero added to the minimum time and one-half of the poll period to the typical (nominal) time.

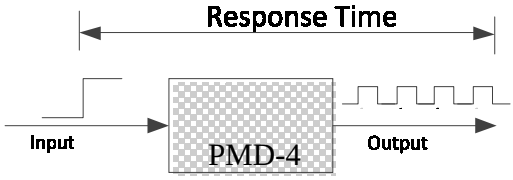

Figure 5, Single PMD-4/PMD-4R System, Module I/O Input, Communications Output

Processing Event		Response Time (ms)		
		Minimum	**Maximum**	**Typical (Nominal)**
1	VIO Input (Filtered Detection)	64	128	96
2	Input De-bounce	256	320	256
3	Vital Message and Equation Processing	60	496	230
4	Message processing by the Communications (non-vital) processor	10	200	50
	TOTAL	**390**	**1144**	**632**

Multiple Unit Performance – Communication Based I/O

Figure 6 depicts the response time model for two PMD-4/PMD-4R units connected via RP200x communications where the trigger on the first unit is an external input and the resulting output on the second unit is also an external output. The response is measured from the transition of the input on PMD-4(1) to the transition of the output on PMD-4(2).

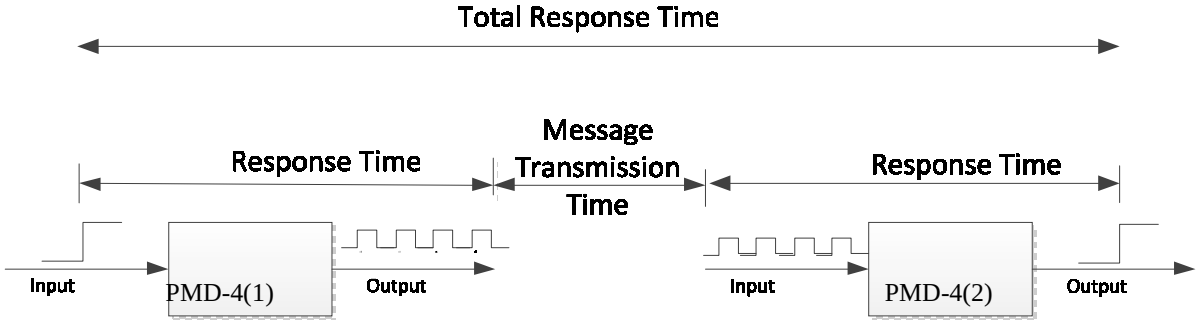

Figure 6, Two PMD-4/PMD-4R Units, Communication I/O

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Special Considerations for RP200x Communications

The response time tables that include RP200x communications depict that, depending on the transmission medium, Message Transmission time may or may not be significant to the overall response time. In the case of Ethernet as the medium, the transmission time was not included in the overall total as the time to transmit an RP200x message is less than one millisecond. That is, when the network is operating normally, the total response time of the various scenarios is unaffected by the transmission time. However, there are cases that must be considered when the Ethernet network is not in normal operation.

The first case is a simple loss of communication between two or more units. When a loss of communication occurs (e.g. interference or equipment breakage) an RP200x unit continues to operate on the last valid message received up to the Message Timeout time (typically set to 1 second). When analyzing the system design for safety related response times, the Message Timeout time must be taken into consideration.

The second case is message latency in the event that the network becomes congested and / or network devices are otherwise inducing delay in message delivery. When network delays occur, an RP200x unit will tolerate a round-trip delay of up to Maximum Receive Time Difference and still consider the received message to be valid. When analyzing the system design for safety related response times, the Maximum Receive Time Difference must be taken into consideration and the entire allowed delay must be assumed to be on only one the incoming message of the round trip transaction as the worst-case assumption. RP2000 is not supported for PMD-4/PMD-4R, only RP-2009.

For example, in Figure 8, two units are connected with RP200x communications. An external input on PMD-4(1) is being used to set the state of an external output on PMD-4(2). If the maximum possible Total Response Time has safety significance, then the Message Timeout Time and Maximum Receive Time Difference values must be included.

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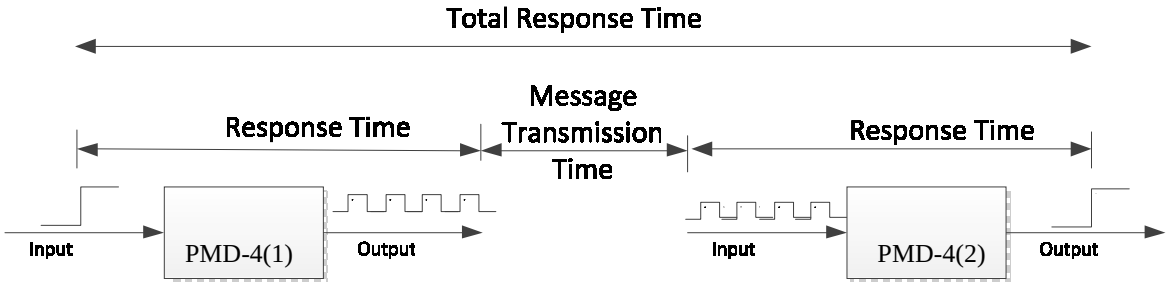

Figure 8, Two System Maximum Response Time

The analysis for RP2009 must account for additional time parameters as part of that protocol. In the RP2009 case, the units must interact with each other at the set Heartbeat Message Interval as a minimum. When the Heartbeat Message Interval expires, the unit will initiate an RP2009 message to the other and the initiator must receive a valid response from the other unit within the set Acknowledge Timeout Time. Since the response received by the initiating unit is valid only if the received message is more recent than the initiating message, the maximum network delay (non-processing delay) permitted by the initiating unit is the sum of the Heartbeat Message Interval and the Acknowledge Timeout Time.

However, the Maximum Receive Time Difference value must be added in the case of a non-initiating unit. The worst-case scenario occurs as follows:

- A remote unit initiates an RP2009 message
- After the message is transmitted a safety related input to the remote unit is received, but the unit is unable to successfully transmit additional RP2009 messages with this new information.
- The message initiated in step 1 incurs a network induced delay of Maximum Receive Time Difference prior to being received.
- The message arrives and is processed by the receiving unit and that unit resets its Heartbeat Message Interval.
- Since no further communicate is received from the remote unit, the Heartbeat Message Interval expires on the receiving unit causing it to imitate a message to the remote unit.
- The remote unit fails to respond and this condition is detected after Acknowledge Timeout Time elapses.

Therefore, the worst-case delay that is added to the maximum processing delays is Maximum Receive Time Difference + Heartbeat Message Interval + Acknowledge Timeout. The response table where the times are set to 1.5 seconds, 2.0 seconds and 1.0 seconds respectively is shown below.

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Processing Event			RP2009 Network Response Time (ms)	
			Maximum (Normal Network)	**Maximum (Abnormal Network)**
1	PMD-4(1)	VIO Input (Filtered Detection)	128	128
2	PMD-4(1)	Input De-bounce	320	320
3	PMD-4(1)	Vital Message and Equation Processing	496	496
4	PMD-4(1)	Message processing by the Communications (non-vital) processor	200	Covered by Maximum Network Delay
5		Maximum Network Induced Delay		4.5 Seconds *
6	PMD-4(2)	Message processing by the Communications (non-vital) processor	200	Covered by Maximum Network Delay
7	PMD-4(2)	Vital Message and Equation Processing &	496	496
	TOTAL		**1840**	**5940**

** Sum of the Heartbeat Message Interval, Acknowledge Time out Time and Maximum Receive Time difference for RP2009.*

These worst-case network scenarios are very unlikely to occur. However, for safety related maximum possible response time calculations, they do represent the extremes that could occur prior to one of the protocol error detection mechanisms triggering a safety response.

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Appendix D - SSH Command Syntax

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Examples

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SSH Commands

SSH Commands

Command	Description	Sub Menu	Syntax
stagev	Stages a single vital configuration parameter value pair to a proposed list of candidates for further checking and applying. Value integritry and range checking is performed on the new value and must meet the parameter's criteria Example: > stagev VEMP.WiuAddress 700000000000 > stagev VEMP.TimeMessBeforeSendWSM 5 > checkv	<Vital parameter name> <value>	stagev <vital parameter name> <value>
stagenv	Stage single Non-vital configuration Parameter value pair to a proposed list of candidates for further checking and applying. Value integritry and range checking is performed on the new value and must meet the parameter's criteria. Example: > stagenv WIUGEN.BcnContinuous = Enabled > stagenv WIUGEN.BncOnChange = No > checknv	<Non-Vital parameter name> <value>	stagenv <non-vital parameter name> <value>
stagesnmp	Stage single SNMP text configuration Parameter value pair to a proposed list of candidates for further checking and applying. Value integritry and range checking is performed on the new value and must meet the parameter's criteria. Example: > stagesnmp SNMP.TrapEnabled Enabled > checksnmp	<SNMP parameter name> <value>	stagesnmp <snmp parameter name> <value>

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SSH Commands

Command	Description	Sub Menu	Syntax
Show	Show configuration value **show nvcf, vcf**, and **snmpcf** shows the list of configuration parameters and values that can be staged. Show also allows showing individual parameter values - e.g. show VEMP.WiuAddress displays the wiu vital address	Parameter name : <value> **all** <all parameters in the Active system configuration WebGUI page> **nvapp** <Non-vital Application information> **vapp** <Vital Appplication information> **ptcapp** <PTC App information> **ptckey**< HMAC, RC2key CRC info, encrypted HMAC key value > **exec** <Executive Information> **boot** <Boot information> **genera**l <General information> **comm** <Ethernet communications parameters> **vcf** <vital text config parameters> **nvcf**<non-vital text config parameters> **snmpcf**<snmp text config parameters> **files** shows uploaded non applied files – Application, exec, boot, PTC Map, PTC config, Vital Text config, NV text config, SNMP text config, RC2 key, Authorized Key, HMAC, selective function	show <parameter name> show <option>

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SSH Commands

Command	Description	Sub Menu	Syntax
		wiu host signal system, Site ID, WIU enabled state, PTC Enabled State, PTC Time Sync State **authkey -** displays the contents of the authorized key file **selective -** shows selective function enabled parameter **staged -** shows the parameters that have been staged but not yet applied	
checkv	1) Performs integrity and range check against the vital parameter's criteria that are in the staged list. It further does a cross integrity against all staged and current configuration parameters. 2) Creates the vcf file that a user with local presence applies via the webGUI- used in conjunction with stagev command	**N/A**	checkv
checknv	1) Performs integrity and range check against the non-vital parameter's criteria that are in the staged list. It further does a cross integrity against all staged and current configuration parameters. 2) Creates the nvcf file that a user can apply via the webGUI or the apply command - used in conjunction with stagenv command.	N/A	checknv

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SSH Commands

Command	Description	Sub Menu	Syntax
checksnmp	1) Performs integrity and range check against the snmp parameter's criteria that are in the staged list. It further does a cross integrity against all staged and current configuration parameters. 2)Creates the snmpcf file that a user can apply via the webGUI or the apply command - used in conjunction with stagesnmp command.	N/A	checksnmp
Get	Copies configuration parameters identified by sub menu to externally accessible directory on the WIU. This file can then be copied from WIU to remote computer using SCP or sftp. If no filename is specified defaults to config_vcf.txt (vital config file); config_nvcf.txt (non-vital config file); and config_snmpcf.txt (snmp config file)	vcf nvcf snmpcf	get <option> <filename>
validate	Validates the integrity of uploaded binary files and the integrity and content of uploaded text configuration files. Validate is run on a file that has been copied (scp or sftp) from a remote computer to the WIU. Files that require time effectivity will prompt for start and end times, or these can be added to the command line. Once a file is validated it is moved from the Saved Configuration file partition (root directory) to the Upload Software File partition. Files that can be validated are: **vcf** - vital configuration text file **nvcf** - non-vital configuration text file **snmpcf** - snmp configuration text file **snmpbin** - snmp binary configuration text file **boot** - boot executive binary file **exec** - executive binary file	vcf nvcf snmpcf snmpbin boot exec ptcconfig ptcmap app rc2 hmac authkey selective list	validate vcf <filename> validate nvcf <filename> validate snmpcf <filename> validate snmpbin <filename> validate boot <filename> validate exec <filename> validate ptcconfig <filename> validate ptcmap <filename> validate app <filename> validate rc2 <filename> validate hmac <filename> <mm/dd/yyyy> <hh:mm:ss> validate authkey <filename> <mm/dd/yyyy> <hh:mm:ss> <mm/dd/yyyy> <hh:mm:ss> validate selective <filename> validate list

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SSH Commands

Command	Description	Sub Menu	Syntax
	ptcconfig - PTC Configuration binary file **ptcmap** - PTC Mapping binary file **app** - Signaling application binary file **rc2** - RC2 Key PTC Class D authentication file **hmac** - PTC Class D encrypted HMAC key file - additional information required: apply date and time <mm/dd/yyyy> <hh:mm:ss> defaults to current date and time. **authkey** - SSH authorized key authentication file- additional information required: apply date and time <mm/dd/yyyy> <hh:mm:ss> and expire date and time <mm/dd/yyyy> <hh:mm:ss> **selective** - Selective function key file **list** - displays the list of files that are available to validate.		
Apply	Applies non vital configuration text files, SNMP configuration text files, SNMP binary files, RC2 Key files, PTC HMAC key files, SSH Authorized Key files, and Selective Function key files. File is copied to WIU using SCP. Or created using the checknv command. Note: No vital parameters can be applied remotely as vital parameters must be applied locally. Once files are applied the uploaded files are deleted.	nvcf snmpcf snmpbin rc2 hmac authkey selective	apply <option>
delete	Deletes uploaded file from local storage. List of uploaded files is obtained using the show files command. delete all deletes all files from both the uploaded and root partitions.	nvcf snmpcf snmpbin rc2 hmac authkey selective	delete <filename> delete all

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SSH Commands

Command	Description	Sub Menu	Syntax
Help	Displays list of available commands and syntax for a command when used after the command	help	Help <command> help
Exit	Exits the ssh command shell	N/A	Exit

SCP syntax

Command	Description	Sub Menu	Syntax
scp or sftp	remote copies files between remote computer and WIU: Files that can be copied to WIU are: **vital text config file** (following copy, user must apply the file via WebGUI after setting local presence). current vital configuration text file generated by a get command can be copied from the WIU to the remote computer **non-vital text config file** (following copy, user can either remotely issue runnv command to apply parameters or log on to WebGUI to apply manually. Current non-vital configuration text file generated by a get command can be copied from the WIU to the remote computer **snmp text config file** (following copy, user can either remotely issue runnv command to apply parameters or log on to WebGUI to apply manually. Current snmp configuration text file generated by a get command can be copied from the WIU to the remote computer **executive/boot software** (.bin) **application files** (.b1, .mb1) **PTC mapping file** (.ptcbmap) **PTC config file** (.ptcbcfg) **SNMP binary config file** (.cfg) **Authorized Key File**	N/A	scp filename username@hostname:filename sftp filename username@hostname:filename putty client example: pscp -scp -pw sshuser SNMP_config.cfg admin@192.168.0.11:SNMP_config.cfg pscp -sftp -pw sshuser SNMP_config.cfg admin@192.168.0.11:SNMP_config.cfg

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Settable SSH Parameter List

vital parameter ids - vcf VEMP.WiuAddress
VEMP.TimeMessBeforeSendWSM
VEMP.TimeMessDev
VEMP.IgnoredTimeDif
VEMP.MaxSecsTimeChange
VEMP.MaxTimeChangeWithinMins
VEMP.DebounceTime.0.TEST1
VEMP.AppPropertyBits.0
VEMP.DebounceTime.1.TEST2
VEMP.AppPropertyBits.1
VEMP.DebounceTime.2.TEST3
VEMP.AppPropertyBits.2
VEMP.DebounceTime.3.TEST4
VEMP.AppPropertyBits.3
VEMP.DebounceTime.4.TEST5
VEMP.AppPropertyBits.4

non-vital parameter ids - nvcf
WIUGEN.BcnContinuous
WIUGEN.BncOnChange
WIUGEN.ExtTimeUpdTimeout
WIUGEN.BcnRate WIUGEN.BcnBitTime
WIUGEN.BcnEndTime
WIUGEN.MaxBcnInterval
EMPWSM.SourceAddress
EMPWSM.DestinationAddress
EMPWSM.TimeFormat
EMPWSM.Encryption
EMPWSM.Compression
EMPWSM.DataIntegrity
EMPWSM.PTC_ReSyncEnable
EMPWSM.TTL_TimedBeacon
EMPWSM.QoS_TimedBeacon
EMPWSM.TTL_GetWSM
EMPWSM.QoS_GetWSM
EMPWSM.LRMMaxSecsTimeDif
EMPWSM.NoTimeSyncMessage
EMPD.DestinationIpAddress.1

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EMPD.DestinationIpAddress.2
EMPD.DestinationIpAddress.3
EMPD.DestinationIpAddress.4
EMPD.DestinationIpAddress.5
EMPD.DestinationIpAddress.6
EMPD.DestinationIpAddress.7
EMPD.DestinationIpAddress.8
EMPD.DestinationIpPort.1
EMPD.DestinationIpPort.2
EMPD.DestinationIpPort.3
EMPD.DestinationIpPort.4
EMPD.DestinationIpPort.5
EMPD.DestinationIpPort.6
EMPD.DestinationIpPort.7
EMPD.DestinationIpPort.8
EMPD.Mode EMPD.LogTraffic
EMPD.DataAckEnabled
EMPD.KeepAliveInterval
EMPD.KeepAliveAckTimeout
EMPD.DataAckTimeout
EMPD.DataNakRetryLimit
EMPD.RetransmitDelay
EMPD.ConnectionAttemptTimeout
EMPD.ConnectionDelay EMPD.ConnectionRetryLimit
EMPD.ReconnectionLimit EMPD.HighAvailabilityMode

SNMP Paramater ids - snmpcf

SNMP.TrapEnable
SNMP.WiuHeartbeatLogEnable
SNMP.DestUdpPort.1
SNMP.DestAdd.1
SNMP.DestUdpPort.2
SNMP.DestAdd.2
SNMP.WaysideDevType
SNMP.Location SNMP.PriComStr
SNMP.PubComStr
SNMP.TemporaryTrapDisableTime SNMP_TRAP.TrapEnable

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SNMP_TRAP.TrapID SNMP_TRAP.Flag
SNMP_TRAP.Priority
SNMP_TRAP.NumOfOcc
SNMP_TRAP.Time
SNMP_TRAP.ClearFlag
SNMP_TRAP.ClearPriority
SNMP_TRAP.ClearNumOfOcc
SNMP_TRAP.ClearTime SNMP_TRAP.TrapText
SNMP_TRAP.ClearTrapText
SNMP_TRAP.TextField1 SNMP_TRAP.TextField2
SNMP_TRAP.ClearTextField1
SNMP_TRAP.ClearTextField2
SNMP_TRAP.SpecTrapReason
SNMP_TRAP.ClearSpecTrapReason
SNMP_TRAP.SpecificTrap
SNMP_TRAP.ClearTrapID

ACPower.SNMP_TRAP.TrapEnable
ACPower.SNMP_TRAP.TrapText
ACPower.SNMP_TRAP.ClearTrapText
ACPower.SNMP_TRAP.Time
ACPower.SNMP_TRAP.ClearTime

ACPower.SNMP_TRAP.SpecificTrapEnable
ACPower.SNMP_TRAP.TrapID
ACPower.SNMP_TRAP.ClearTrapID
ACPower.SNMP_TRAP.SpecTrapReason
ACPower.SNMP_TRAP.ClearSpecTrapReason
ACPower.SNMP_TRAP.Flag ACPower.SNMP_TRAP.ClearFlag
ACPower.SNMP_TRAP.Priority
ACPower.SNMP_TRAP.ClearPriority
ACPower.SNMP_TRAP.TextField1

ACPower.SNMP_TRAP.ClearTextField1 ACPower.SNMP_TRAP.TextField2
ACPower.SNMP_TRAP.ClearTextField2

Temperature.SNMP_TRAP.TrapEnable Temperature.SNMP_TRAP.TrapText
Temperature.SNMP_TRAP.ClearTrapText Temperature.SNMP_TRAP.Time
Temperature.SNMP_TRAP.ClearTime

Temperature.SNMP_TRAP.SpecificTrapEnable
Temperature.SNMP_TRAP.TrapID
Temperature.SNMP_TRAP.ClearTrapID
Temperature.SNMP_TRAP.SpecTrapReason

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Temperature.SNMP_TRAP.ClearSpecTrapReason
Temperature.SNMP_TRAP.Flag
Temperature.SNMP_TRAP.ClearFlag
Temperature.SNMP_TRAP.Priority
Temperature.SNMP_TRAP.ClearPriority
Temperature.SNMP_TRAP.TextField1
Temperature.SNMP_TRAP.ClearTextField1
Temperature.SNMP_TRAP.TextField2
Temperature.SNMP_TRAP.ClearTextField2

EnclosureDoor.SNMP_TRAP.TrapEnable
EnclosureDoor.SNMP_TRAP.TrapText
EnclosureDoor.SNMP_TRAP.ClearTrapText
EnclosureDoor.SNMP_TRAP.Time EnclosureDoor.SNMP_TRAP.ClearTime

EnclosureDoor.SNMP_TRAP.SpecificTrapEnable
EnclosureDoor.SNMP_TRAP.TrapID
EnclosureDoor.SNMP_TRAP.ClearTrapID
EnclosureDoor.SNMP_TRAP.SpecTrapReason
EnclosureDoor.SNMP_TRAP.ClearSpecTrapReason
EnclosureDoor.SNMP_TRAP.Flag
EnclosureDoor.SNMP_TRAP.ClearFlag
EnclosureDoor.SNMP_TRAP.Priority
EnclosureDoor.SNMP_TRAP.ClearPriority
EnclosureDoor.SNMP_TRAP.TextField1
EnclosureDoor.SNMP_TRAP.ClearTextField1
EnclosureDoor.SNMP_TRAP.TextField2

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EnclosureDoor.SNMP_TRAP.ClearTextField2

SignalingAlarm.SNMP_TRAP.TrapEnable SignalingAlarm.SNMP_TRAP.TrapText
SignalingAlarm.SNMP_TRAP.ClearTrapText

OpenTrackCKTDetected.SNMP_TRAP.SpecificTrapEnable
OpenTrackCKTDetected.SNMP_TRAP.TrapID OpenTrackCKTDetected.SNMP_TRAP.ClearTrapID
OpenTrackCKTDetected.SNMP_TRAP.SpecTrapReason
OpenTrackCKTDetected.SNMP_TRAP.ClearSpecTrapReason

OpenTrackCKTDetected.SNMP_TRAP.Flag OpenTrackCKTDetected.SNMP_TRAP.ClearFlag
OpenTrackCKTDetected.SNMP_TRAP.Priority OpenTrackCKTDetected.SNMP_TRAP.ClearPriority
OpenTrackCKTDetected.SNMP_TRAP.TextField1
OpenTrackCKTDetected.SNMP_TRAP.ClearTextField1
OpenTrackCKTDetected.SNMP_TRAP.TextField2
OpenTrackCKTDetected.SNMP_TRAP.ClearTextField2

SystemHealth.SNMP_TRAP.TrapEnable
SystemHealth.SNMP_TRAP.TrapText
SystemHealth.SNMP_TRAP.ClearTrapText

ModuleHealth.SNMP_TRAP.SpecificTrapEnable
ModuleHealth.SNMP_TRAP.TrapID ModuleHealth.SNMP_TRAP.ClearTrapID

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ModuleHealth.SNMP_TRAP.SpecTrapReason
ModuleHealth.SNMP_TRAP.ClearSpecTrapReason
ModuleHealth.SNMP_TRAP.Flag ModuleHealth.SNMP_TRAP.ClearFlag
ModuleHealth.SNMP_TRAP.Priority
ModuleHealth.SNMP_TRAP.ClearPriority
ModuleHealth.SNMP_TRAP.TextField1
ModuleHealth.SNMP_TRAP.ClearTextField1
ModuleHealth.SNMP_TRAP.TextField2
ModuleHealth.SNMP_TRAP.ClearTextField2

ModuleRemoved.SNMP_TRAP.SpecificTrapEnable
ModuleRemoved.SNMP_TRAP.TrapID
ModuleRemoved.SNMP_TRAP.ClearTrapID
ModuleRemoved.SNMP_TRAP.SpecTrapReason
ModuleRemoved.SNMP_TRAP.ClearSpecTrapReason
ModuleRemoved.SNMP_TRAP.Flag
ModuleRemoved.SNMP_TRAP.ClearFlag
ModuleRemoved.SNMP_TRAP.Priority
ModuleRemoved.SNMP_TRAP.ClearPriority
ModuleRemoved.SNMP_TRAP.TextField1
ModuleRemoved.SNMP_TRAP.ClearTextField1
ModuleRemoved.SNMP_TRAP.TextField2
ModuleRemoved.SNMP_TRAP.ClearTextField2

ModuleNotInstalled.SNMP_TRAP.SpecificTrapEnable
ModuleNotInstalled.SNMP_TRAP.TrapID ModuleNotInstalled.SNMP_TRAP.ClearTrapID
ModuleNotInstalled.SNMP_TRAP.SpecTrapReason
ModuleNotInstalled.SNMP_TRAP.ClearSpecTrapReason

ModuleNotInstalled.SNMP_TRAP.Flag ModuleNotInstalled.SNMP_TRAP.ClearFlag
ModuleNotInstalled.SNMP_TRAP.Priority
ModuleNotInstalled.SNMP_TRAP.ClearPriority
ModuleNotInstalled.SNMP_TRAP.TextField1
ModuleNotInstalled.SNMP_TRAP.ClearTextField1
ModuleNotInstalled.SNMP_TRAP.TextField2
ModuleNotInstalled.SNMP_TRAP.ClearTextField2

CommunicationsLink.SNMP_TRAP.TrapEnable
CommunicationsLink.SNMP_TRAP.TrapText

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CommunicationsLink.SNMP_TRAP.ClearTrapText
CommunicationsLink.SNMP_TRAP.NumOfOcc
CommunicationsLink.SNMP_TRAP.Time

ClassDMessageError.SNMP_TRAP.SpecificTrapEnable
ClassDMessageError.SNMP_TRAP.TrapID ClassDMessageError.SNMP_TRAP.ClearTrapID
ClassDMessageError.SNMP_TRAP.SpecTrapReason
ClassDMessageError.SNMP_TRAP.ClearSpecTrapReason
ClassDMessageError.SNMP_TRAP.Flag ClassDMessageError.SNMP_TRAP.ClearFlag
ClassDMessageError.SNMP_TRAP.Priority ClassDMessageError.SNMP_TRAP.ClearPriority
ClassDMessageError.SNMP_TRAP.TextField1
ClassDMessageError.SNMP_TRAP.ClearTextField1
ClassDMessageError.SNMP_TRAP.TextField2
ClassDMessageError.SNMP_TRAP.ClearTextField2

VitalRemoteLinkError.SNMP_TRAP.SpecificTrapEnable
VitalRemoteLinkError.SNMP_TRAP.TrapID
VitalRemoteLinkError.SNMP_TRAP.ClearTrapID
VitalRemoteLinkError.SNMP_TRAP.SpecTrapReason
VitalRemoteLinkError.SNMP_TRAP.ClearSpecTrapReason
VitalRemoteLinkError.SNMP_TRAP.Flag
VitalRemoteLinkError.SNMP_TRAP.ClearFlag
VitalRemoteLinkError.SNMP_TRAP.Priority
VitalRemoteLinkError.SNMP_TRAP.ClearPriority
VitalRemoteLinkError.SNMP_TRAP.TextField1
VitalRemoteLinkError.SNMP_TRAP.ClearTextField1
VitalRemoteLinkError.SNMP_TRAP.TextField2
VitalRemoteLinkError.SNMP_TRAP.ClearTextField2

OfficeCodeFail.SNMP_TRAP.SpecificTrapEnable
OfficeCodeFail.SNMP_TRAP.TrapID
OfficeCodeFail.SNMP_TRAP.ClearTrapID
OfficeCodeFail.SNMP_TRAP.SpecTrapReason
OfficeCodeFail.SNMP_TRAP.ClearSpecTrapReason
OfficeCodeFail.SNMP_TRAP.Flag
OfficeCodeFail.SNMP_TRAP.ClearFlag
OfficeCodeFail.SNMP_TRAP.Priority
OfficeCodeFail.SNMP_TRAP.ClearPriority
OfficeCodeFail.SNMP_TRAP.TextField1
OfficeCodeFail.SNMP_TRAP.ClearTextField1
OfficeCodeFail.SNMP_TRAP.TextField2
OfficeCodeFail.SNMP_TRAP.ClearTextField2

OfficeLinkFail.SNMP_TRAP.SpecificTrapEnable

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OfficeLinkFail.SNMP_TRAP.TrapID
OfficeLinkFail.SNMP_TRAP.ClearTrapID
OfficeLinkFail.SNMP_TRAP.SpecTrapReason
OfficeLinkFail.SNMP_TRAP.ClearSpecTrapReason
OfficeLinkFail.SNMP_TRAP.Flag OfficeLinkFail.SNMP_TRAP.ClearFlag
OfficeLinkFail.SNMP_TRAP.Priority
OfficeLinkFail.SNMP_TRAP.ClearPriority
OfficeLinkFail.SNMP_TRAP.TextField1

OfficeLinkFail.SNMP_TRAP.ClearTextField1
OfficeLinkFail.SNMP_TRAP.TextField2
OfficeLinkFail.SNMP_TRAP.ClearTextField2

DupMACDetected.SNMP_TRAP.SpecificTrapEnable
DupMACDetected.SNMP_TRAP.TrapID DupMACDetected.SNMP_TRAP.ClearTrapID
DupMACDetected.SNMP_TRAP.SpecTrapReason
DupMACDetected.SNMP_TRAP.ClearSpecTrapReason
DupMACDetected.SNMP_TRAP.Flag DupMACDetected.SNMP_TRAP.ClearFlag
DupMACDetected.SNMP_TRAP.Priority
DupMACDetected.SNMP_TRAP.ClearPriority
DupMACDetected.SNMP_TRAP.TextField1
DupMACDetected.SNMP_TRAP.ClearTextField1
DupMACDetected.SNMP_TRAP.TextField2
DupMACDetected.SNMP_TRAP.ClearTextField2

DupIPAddressDetected.SNMP_TRAP.SpecificTrapEnable
DupIPAddressDetected.SNMP_TRAP.TrapID
DupIPAddressDetected.SNMP_TRAP.ClearTrapID
DupIPAddressDetected.SNMP_TRAP.SpecTrapReason
DupIPAddressDetected.SNMP_TRAP.ClearSpecTrapReason
DupIPAddressDetected.SNMP_TRAP.Flag
DupIPAddressDetected.SNMP_TRAP.ClearFlag
DupIPAddressDetected.SNMP_TRAP.Priority
DupIPAddressDetected.SNMP_TRAP.ClearPriority
DupIPAddressDetected.SNMP_TRAP.TextField1
DupIPAddressDetected.SNMP_TRAP.ClearTextField1
DupIPAddressDetected.SNMP_TRAP.TextField2
DupIPAddressDetected.SNMP_TRAP.ClearTextField2

CrossingAlarm.SNMP_TRAP.TrapEnable CrossingAlarm.SNMP_TRAP.TrapText
CrossingAlarm.SNMP_TRAP.ClearTrapText

CrossingHighSignalFault.SNMP_TRAP.SpecificTrapEnable CrossingHighSignalFault.SNMP_TRAP.TrapID
CrossingHighSignalFault.SNMP_TRAP.ClearTrapID
CrossingHighSignalFault.SNMP_TRAP.SpecTrapReason

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CrossingHighSignalFault.SNMP_TRAP.ClearSpecTrapReason CrossingHighSignalFault.SNMP_TRAP.Flag

CrossingHighSignalFault.SNMP_TRAP.ClearFlag
CrossingHighSignalFault.SNMP_TRAP.Priority
CrossingHighSignalFault.SNMP_TRAP.ClearPriority
CrossingHighSignalFault.SNMP_TRAP.TextField1
CrossingHighSignalFault.SNMP_TRAP.ClearTextField1
CrossingHighSignalFault.SNMP_TRAP.TextField2
CrossingHighSignalFault.SNMP_TRAP.ClearTextField2

CrossingLowPhaseFault.SNMP_TRAP.SpecificTrapEnable
CrossingLowPhaseFault.SNMP_TRAP.TrapID
CrossingLowPhaseFault.SNMP_TRAP.ClearTrapID
CrossingLowPhaseFault.SNMP_TRAP.SpecTrapReason
CrossingLowPhaseFault.SNMP_TRAP.ClearSpecTrapReason
CrossingLowPhaseFault.SNMP_TRAP.Flag
CrossingLowPhaseFault.SNMP_TRAP.ClearFlag
CrossingLowPhaseFault.SNMP_TRAP.Priority
CrossingLowPhaseFault.SNMP_TRAP.ClearPriority
CrossingLowPhaseFault.SNMP_TRAP.TextField1
CrossingLowPhaseFault.SNMP_TRAP.ClearTextField1
CrossingLowPhaseFault.SNMP_TRAP.TextField2
CrossingLowPhaseFault.SNMP_TRAP.ClearTextField2

TransmitterCheckAlarm.SNMP_TRAP.SpecificTrapEnable
TransmitterCheckAlarm.SNMP_TRAP.TrapID
TransmitterCheckAlarm.SNMP_TRAP.ClearTrapID
TransmitterCheckAlarm.SNMP_TRAP.SpecTrapReason
TransmitterCheckAlarm.SNMP_TRAP.ClearSpecTrapReason
TransmitterCheckAlarm.SNMP_TRAP.Flag
TransmitterCheckAlarm.SNMP_TRAP.ClearFlag
TransmitterCheckAlarm.SNMP_TRAP.Priority
TransmitterCheckAlarm.SNMP_TRAP.ClearPriority
TransmitterCheckAlarm.SNMP_TRAP.TextField1
TransmitterCheckAlarm.SNMP_TRAP.ClearTextField1
TransmitterCheckAlarm.SNMP_TRAP.TextField2
TransmitterCheckAlarm.SNMP_TRAP.ClearTextField2

XingTrackCKTCalRequired.SNMP_TRAP.SpecificTrapEnable
XingTrackCKTCalRequired.SNMP_TRAP.TrapID
XingTrackCKTCalRequired.SNMP_TRAP.ClearTrapID
XingTrackCKTCalRequired.SNMP_TRAP.SpecTrapReason
XingTrackCKTCalRequired.SNMP_TRAP.ClearSpecTrapReason
XingTrackCKTCalRequired.SNMP_TRAP.Flag

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XingTrackCKTCalRequired.SNMP_TRAP.ClearFlag XingTrackCKTCalRequired.SNMP_TRAP.Priority
XingTrackCKTCalRequired.SNMP_TRAP.ClearPriority
XingTrackCKTCalRequired.SNMP_TRAP.TextField1
XingTrackCKTCalRequired.SNMP_TRAP.ClearTextField1
XingTrackCKTCalRequired.SNMP_TRAP.TextField2
XingTrackCKTCalRequired.SNMP_TRAP.ClearTextField2

XingParamsDefaulted.SNMP_TRAP.SpecificTrapEnable
XingParamsDefaulted.SNMP_TRAP.TrapID XingParamsDefaulted.SNMP_TRAP.ClearTrapID
XingParamsDefaulted.SNMP_TRAP.SpecTrapReason
XingParamsDefaulted.SNMP_TRAP.ClearSpecTrapReason
XingParamsDefaulted.SNMP_TRAP.Flag XingParamsDefaulted.SNMP_TRAP.ClearFlag
XingParamsDefaulted.SNMP_TRAP.Priority XingParamsDefaulted.SNMP_TRAP.ClearPriority
XingParamsDefaulted.SNMP_TRAP.TextField1
XingParamsDefaulted.SNMP_TRAP.ClearTextField1
XingParamsDefaulted.SNMP_TRAP.TextField2
XingParamsDefaulted.SNMP_TRAP.ClearTextField2

DecreasingPhaseFault.SNMP_TRAP.SpecificTrapEnable
DecreasingPhaseFault.SNMP_TRAP.TrapID
DecreasingPhaseFault.SNMP_TRAP.ClearTrapID
DecreasingPhaseFault.SNMP_TRAP.SpecTrapReason
DecreasingPhaseFault.SNMP_TRAP.ClearSpecTrapReason
DecreasingPhaseFault.SNMP_TRAP.Flag
DecreasingPhaseFault.SNMP_TRAP.ClearFlag
DecreasingPhaseFault.SNMP_TRAP.Priority
DecreasingPhaseFault.SNMP_TRAP.ClearPriority
DecreasingPhaseFault.SNMP_TRAP.TextField1
DecreasingPhaseFault.SNMP_TRAP.ClearTextField1
DecreasingPhaseFault.SNMP_TRAP.TextField2
DecreasingPhaseFault.SNMP_TRAP.ClearTextField2

ApproachReleaseFault.SNMP_TRAP.SpecificTrapEnable ApproachReleaseFault.SNMP_TRAP.TrapID
ApproachReleaseFault.SNMP_TRAP.ClearTrapID
ApproachReleaseFault.SNMP_TRAP.SpecTrapReason
ApproachReleaseFault.SNMP_TRAP.ClearSpecTrapReason ApproachReleaseFault.SNMP_TRAP.Flag

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ApproachReleaseFault.SNMP_TRAP.ClearFlag
ApproachReleaseFault.SNMP_TRAP.Priority
ApproachReleaseFault.SNMP_TRAP.ClearPriority
ApproachReleaseFault.SNMP_TRAP.TextField1
ApproachReleaseFault.SNMP_TRAP.ClearTextField1
ApproachReleaseFault.SNMP_TRAP.TextField2
ApproachReleaseFault.SNMP_TRAP.ClearTextField2

FalseShuntFault.SNMP_TRAP.SpecificTrapEnable
FalseShuntFault.SNMP_TRAP.TrapID FalseShuntFault.SNMP_TRAP.ClearTrapID
FalseShuntFault.SNMP_TRAP.SpecTrapReason
FalseShuntFault.SNMP_TRAP.ClearSpecTrapReason
FalseShuntFault.SNMP_TRAP.Flag FalseShuntFault.SNMP_TRAP.ClearFlag
FalseShuntFault.SNMP_TRAP.Priority FalseShuntFault.SNMP_TRAP.ClearPriority
FalseShuntFault.SNMP_TRAP.TextField1
FalseShuntFault.SNMP_TRAP.ClearTextField1
FalseShuntFault.SNMP_TRAP.TextField2
FalseShuntFault.SNMP_TRAP.ClearTextField2

ConfigurationChange.SNMP_TRAP.TrapEnable
ConfigurationChange.SNMP_TRAP.TrapText

VitalConfigChange.SNMP_TRAP.SpecificTrapEnable
VitalConfigChange.SNMP_TRAP.TrapID
VitalConfigChange.SNMP_TRAP.SpecTrapReason
VitalConfigChange.SNMP_TRAP.Flag VitalConfigChange.SNMP_TRAP.Priority
VitalConfigChange.SNMP_TRAP.TextField1
VitalConfigChange.SNMP_TRAP.TextField2

NonVitalConfigChange.SNMP_TRAP.SpecificTrapEnable
NonVitalConfigChange.SNMP_TRAP.TrapID
NonVitalConfigChange.SNMP_TRAP.SpecTrapReason
NonVitalConfigChange.SNMP_TRAP.Flag
NonVitalConfigChange.SNMP_TRAP.Priority
NonVitalConfigChange.SNMP_TRAP.TextField1
NonVitalConfigChange.SNMP_TRAP.TextField2

WIUHealth.SNMP_TRAP.TrapEnable

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WIUHealth.SNMP_TRAP.TrapText
WIUHealth.SNMP_TRAP.ClearTrapText
WIUHealth.SNMP_TRAP.Time WIUHealth.SNMP_TRAP.ClearTime

PTCDisabled.SNMP_TRAP.SpecificTrapEnable
PTCDisabled.SNMP_TRAP.TrapID
PTCDisabled.SNMP_TRAP.ClearTrapID
PTCDisabled.SNMP_TRAP.SpecTrapReason
PTCDisabled.SNMP_TRAP.ClearSpecTrapReason
PTCDisabled.SNMP_TRAP.Flag PTCDisabled.SNMP_TRAP.ClearFlag
PTCDisabled.SNMP_TRAP.Priority
PTCDisabled.SNMP_TRAP.ClearPriority
PTCDisabled.SNMP_TRAP.TextField1
PTCDisabled.SNMP_TRAP.ClearTextField1
PTCDisabled.SNMP_TRAP.TextField2
PTCDisabled.SNMP_TRAP.ClearTextField2

ProcessorReset.SNMP_TRAP.SpecificTrapEnable
ProcessorReset.SNMP_TRAP.TrapID
ProcessorReset.SNMP_TRAP.ClearTrapID
ProcessorReset.SNMP_TRAP.SpecTrapReason
ProcessorReset.SNMP_TRAP.ClearSpecTrapReason
ProcessorReset.SNMP_TRAP.Flag
ProcessorReset.SNMP_TRAP.ClearFlag
ProcessorReset.SNMP_TRAP.Priority
ProcessorReset.SNMP_TRAP.ClearPriority
ProcessorReset.SNMP_TRAP.TextField1
ProcessorReset.SNMP_TRAP.ClearTextField1
ProcessorReset.SNMP_TRAP.TextField2
ProcessorReset.SNMP_TRAP.ClearTextField2

ProgramFlashError.SNMP_TRAP.SpecificTrapEnable
ProgramFlashError.SNMP_TRAP.TrapID
ProgramFlashError.SNMP_TRAP.SpecTrapReason
ProgramFlashError.SNMP_TRAP.Flag ProgramFlashError.SNMP_TRAP.Priority
ProgramFlashError.SNMP_TRAP.TextField1
ProgramFlashError.SNMP_TRAP.TextField2

LogFlashError.SNMP_TRAP.SpecificTrapEnable

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LogFlashError.SNMP_TRAP.TrapID
LogFlashError.SNMP_TRAP.SpecTrapReason
LogFlashError.SNMP_TRAP.Flag
LogFlashError.SNMP_TRAP.Priority
LogFlashError.SNMP_TRAP.TextField1
LogFlashError.SNMP_TRAP.TextField2

HostLinkDown.SNMP_TRAP.SpecificTrapEnable
HostLinkDown.SNMP_TRAP.TrapID
HostLinkDown.SNMP_TRAP.ClearTrapID
HostLinkDown.SNMP_TRAP.SpecTrapReason
HostLinkDown.SNMP_TRAP.ClearSpecTrapReason
HostLinkDown.SNMP_TRAP.Flag
HostLinkDown.SNMP_TRAP.ClearFlag
HostLinkDown.SNMP_TRAP.Priority
HostLinkDown.SNMP_TRAP.ClearPriority
HostLinkDown.SNMP_TRAP.TextField1
HostLinkDown.SNMP_TRAP.ClearTextField1
HostLinkDown.SNMP_TRAP.TextField2
HostLinkDown.SNMP_TRAP.ClearTextField2

HMACRejection.SNMP_TRAP.TrapEnable
HMACRejection.SNMP_TRAP.TrapText
HMACRejection.SNMP_TRAP.NumOfOcc
HMACRejection.SNMP_TRAP.Time

HMACRejection.SNMP_TRAP.SpecificTrapEnable
HMACRejection.SNMP_TRAP.TrapID
HMACRejection.SNMP_TRAP.SpecTrapReason
HMACRejection.SNMP_TRAP.Flag HMACRejection.SNMP_TRAP.Priority
HMACRejection.SNMP_TRAP.TextField1
HMACRejection.SNMP_TRAP.TextField2

EMPCRCRejection.SNMP_TRAP.TrapEnable EMPCRCRejection.SNMP_TRAP.TrapText
EMPCRCRejection.SNMP_TRAP.NumOfOcc EMPCRCRejection.SNMP_TRAP.Time

EMPCRCRejection.SNMP_TRAP.SpecificTrapEnable
EMPCRCRejection.SNMP_TRAP.TrapID
EMPCRCRejection.SNMP_TRAP.SpecTrapReason

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EMPCRCRejection.SNMP_TRAP.Flag EMPCRCRejection.SNMP_TRAP.Priority
EMPCRCRejection.SNMP_TRAP.TextField1
EMPCRCRejection.SNMP_TRAP.TextField2

HMACKeyChange.SNMP_TRAP.TrapEnable HMACKeyChange.SNMP_TRAP.TrapText

HMACKeyChange.SNMP_TRAP.SpecificTrapEnable
HMACKeyChange.SNMP_TRAP.TrapID
HMACKeyChange.SNMP_TRAP.SpecTrapReason
HMACKeyChange.SNMP_TRAP.Flag HMACKeyChange.SNMP_TRAP.Priority
HMACKeyChange.SNMP_TRAP.TextField1
HMACKeyChange.SNMP_TRAP.TextField2

TimeSynchronizationError.SNMP_TRAP.TrapEnable
TimeSynchronizationError.SNMP_TRAP.TrapText
TimeSynchronizationError.SNMP_TRAP.ClearTrapText
TimeSynchronizationError.SNMP_TRAP.Time

TimeSyncExpired.SNMP_TRAP.SpecificTrapEnable
TimeSyncExpired.SNMP_TRAP.TrapID
TimeSyncExpired.SNMP_TRAP.ClearTrapID
TimeSyncExpired.SNMP_TRAP.SpecTrapReason
TimeSyncExpired.SNMP_TRAP.ClearSpecTrapReason
TimeSyncExpired.SNMP_TRAP.Flag TimeSyncExpired.SNMP_TRAP.ClearFlag
TimeSyncExpired.SNMP_TRAP.Priority
TimeSyncExpired.SNMP_TRAP.ClearPriority
TimeSyncExpired.SNMP_TRAP.TextField1
TimeSyncExpired.SNMP_TRAP.ClearTextField1
TimeSyncExpired.SNMP_TRAP.TextField2
TimeSyncExpired.SNMP_TRAP.ClearTextField2

TimeSyncNotInitialized.SNMP_TRAP.SpecificTrapEnable
TimeSyncNotInitialized.SNMP_TRAP.TrapID
TimeSyncNotInitialized.SNMP_TRAP.ClearTrapID
TimeSyncNotInitialized.SNMP_TRAP.SpecTrapReason
TimeSyncNotInitialized.SNMP_TRAP.ClearSpecTrapReason
TimeSyncNotInitialized.SNMP_TRAP.Flag
TimeSyncNotInitialized.SNMP_TRAP.ClearFlag

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TimeSyncNotInitialized.SNMP_TRAP.Priority
TimeSyncNotInitialized.SNMP_TRAP.ClearPriority
TimeSyncNotInitialized.SNMP_TRAP.TextField1
TimeSyncNotInitialized.SNMP_TRAP.ClearTextField1
TimeSyncNotInitialized.SNMP_TRAP.TextField2
TimeSyncNotInitialized.SNMP_TRAP.ClearTextField2

TimeSyncDeltaMsgTime.SNMP_TRAP.SpecificTrapEnable
TimeSyncDeltaMsgTime.SNMP_TRAP.TrapID
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearTrapID
TimeSyncDeltaMsgTime.SNMP_TRAP.SpecTrapReason
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearSpecTrapReason
TimeSyncDeltaMsgTime.SNMP_TRAP.Flag
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearFlag
TimeSyncDeltaMsgTime.SNMP_TRAP.Priority
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearPriority
TimeSyncDeltaMsgTime.SNMP_TRAP.TextField1
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearTextField1
TimeSyncDeltaMsgTime.SNMP_TRAP.TextField2
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearTextField2

TimeSyncMsgWindow.SNMP_TRAP.SpecificTrapEnable
TimeSyncMsgWindow.SNMP_TRAP.TrapID
TimeSyncMsgWindow.SNMP_TRAP.ClearTrapID
TimeSyncMsgWindow.SNMP_TRAP.SpecTrapReason
TimeSyncMsgWindow.SNMP_TRAP.ClearSpecTrapReason
TimeSyncMsgWindow.SNMP_TRAP.Flag
TimeSyncMsgWindow.SNMP_TRAP.ClearFlag
TimeSyncMsgWindow.SNMP_TRAP.Priority
TimeSyncMsgWindow.SNMP_TRAP.ClearPriority
TimeSyncMsgWindow.SNMP_TRAP.TextField1
TimeSyncMsgWindow.SNMP_TRAP.ClearTextField1
TimeSyncMsgWindow.SNMP_TRAP.TextField2
TimeSyncMsgWindow.SNMP_TRAP.ClearTextField2

TimeSyncLRMTime.SNMP_TRAP.SpecificTrapEnable
TimeSyncLRMTime.SNMP_TRAP.TrapID
TimeSyncLRMTime.SNMP_TRAP.SpecTrapReason
TimeSyncLRMTime.SNMP_TRAP.Flag
TimeSyncLRMTime.SNMP_TRAP.Priority
TimeSyncLRMTime.SNMP_TRAP.TextField1
TimeSyncLRMTime.SNMP_TRAP.TextField2

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ApplicationChanged.SNMP_TRAP.TrapEnable ApplicationChanged.SNMP_TRAP.TrapText

SignalSystemAppChanged.SNMP_TRAP.SpecificTrapEnable
SignalSystemAppChanged.SNMP_TRAP.TrapID
SignalSystemAppChanged.SNMP_TRAP.SpecTrapReason
SignalSystemAppChanged.SNMP_TRAP.Flag SignalSystemAppChanged.SNMP_TRAP.Priority
SignalSystemAppChanged.SNMP_TRAP.TextField1
SignalSystemAppChanged.SNMP_TRAP.TextField2

PTCMappingFileChanged.SNMP_TRAP.SpecificTrapEnable
PTCMappingFileChanged.SNMP_TRAP.TrapID
PTCMappingFileChanged.SNMP_TRAP.SpecTrapReason
PTCMappingFileChanged.SNMP_TRAP.Flag
PTCMappingFileChanged.SNMP_TRAP.Priority
PTCMappingFileChanged.SNMP_TRAP.TextField1
PTCMappingFileChanged.SNMP_TRAP.TextField2

PTCConfigFileChanged.SNMP_TRAP.SpecificTrapEnable
PTCConfigFileChanged.SNMP_TRAP.TrapID
PTCConfigFileChanged.SNMP_TRAP.SpecTrapReason
PTCConfigFileChanged.SNMP_TRAP.Flag PTCConfigFileChanged.SNMP_TRAP.Priority
PTCConfigFileChanged.SNMP_TRAP.TextField1
PTCConfigFileChanged.SNMP_TRAP.TextField2

InvalidWaysideDeviceStatus.SNMP_TRAP.TrapEnable
InvalidWaysideDeviceStatus.SNMP_TRAP.TrapText InvalidWaysideDeviceStatus.SNMP_TRAP.Time
InvalidWaysideDeviceStatus.SNMP_TRAP.SpecificTrapEnable
InvalidWaysideDeviceStatus.SNMP_TRAP.TrapID
InvalidWaysideDeviceStatus.SNMP_TRAP.SpecTrapReason
InvalidWaysideDeviceStatus.SNMP_TRAP.Flag InvalidWaysideDeviceStatus.SNMP_TRAP.Priority
InvalidWaysideDeviceStatus.SNMP_TRAP.TextField1
InvalidWaysideDeviceStatus.SNMP_TRAP.TextField2

WIUHeartbeat.SNMP_TRAP.TrapEnable
WIUHeartbeat.SNMP_TRAP.TrapText WIUHeartbeat.SNMP_TRAP.Time

WIUHeartbeat.SNMP_TRAP.SpecificTrapEnable
WIUHeartbeat.SNMP_TRAP.TrapID
WIUHeartbeat.SNMP_TRAP.SpecTrapReason
WIUHeartbeat.SNMP_TRAP.Flag

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Display Only Parameter List

show nvapp
Non-Vital Application Information Name
= NVDefault App
Index = 0
EPT CRC = 521D
EPT Checksum = 64E0

show vapp
Vital Application Information
  Name = VDefault App Index
  = 0
  EPT CRC = 2578
  EPT Checksum = 80DC

show ptcapp PTC
Application
  PTC Mapping File
    PTC Editor Version: 1.0.0.3
    Source Filename: D:\Users\207006464\My Documents\PTC Config\officetest\of
ficetest2.ptcprj
    File Compile Date Thursday, May 20, 2010, 6:32:28 PM CRC:
    0x100D1288
  PTC Configuration File
    PTC Editor Version: 1.0.0.0
    Source Filename: D:\PTC\Lab\IXS App\officetest2\officetest2.ptcprj File
    Compile Date Wednesday, May 12, 2010, 12:21:01 PM
    CRC: 0x100D1290

show ptckey
PTC Key Management Configuration
  Encrypted HMAC Key = No HMAC Key Present
  Encrytped HMAC CRC = No HMAC Key Present RC2
  Key File CRC = No RC2 Key Present

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show exec
Executive Information
PN = 083026-807 Ver
= 8.07Bld0110F
Module = VPM-3 Processor
= A
Copyright = GETSGlobalSignaling,LLC(C)2011 PN =
083026-807
Ver = 8.07Bld0110F
Module = VPM-3 Processor
= B
Copyright = GETSGlobalSignaling,LLC(C)2011 PN =
INTERNAL
Ver = FULLBld0112F
Module = VPM-3 Processor
= C
Copyright = GETSGlobalSignaling,LLC.(C)2011 HPN
= 202551-000
Ver = 1.0
Module = CDU
Processor = MC68HC711D3CFN2 Ref =
U2
Copyright = (c)1998HarmonIndustriesInc.
Datecode = 980707

show boot
Boot Information PN
= 083023-511 Ver
= 5.11Bld001
Module = VPM-3 Processor
= A
Copyright = GETSGlobalSignaling,LLC.(C)2011 PN =
083023-511
Ver = 5.11Bld001
Module = VPM-3 Processor
= B
Copyright = GETSGlobalSignaling,LLC.(C)2011 PN =
083023-511
Ver = 5.11Bld001
Module = VPM-3 Processor
= C

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show general General
Information
Application ID = 0 Site
ID = undefined Chassis
ID = 0
Local Time = 11-21-11 11:13:25

show wiu
Host Signal System = ElectroLogIXS Site
ID = undefined
WIU Enabled = Enabled PTC
Enabled = Disabled PTC Time
= Not Established

show files
Upload Software Files PTC
Map File (ptcmap)
PTC Editor Version: 2.0.0.0
Source Filename: C:\SCM\PTC\System Test\Subsystem Test Procedures\PTC EMP-
WIU Messaging Test Procedures\Details\EC5_EIXS\4InputLibrary_EIXS.ptcprj File
Compile Date Thursday, July 29, 2010, 1:43:27 PM
CRC: 3DF88E7B
RC2 Key File (rc2) : Uploaded : CRC = 0xF17B0738 Saved
Configuration Files
HMAC.txt
vpmallepm_boot.bin
HMAC_date.txt
config_vcf.txt
ptc_vital_cfg.txt

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PTC Vital Configuration (note: minimum number of entries is 1)

VEMP.WiuAddress = 0.000.000.000.00
VEMP.TimeMessBeforeSendWSM = 5
VEMP.TimeMessDev = 1
VEMP.IgnoredTimeDif = 3
VEMP.MaxSecsTimeChange = 3
VEMP.MaxTimeChangeWithinMins = 60
VEMP.DebounceTime.0.TEST1 = 2000 VEMP.AppPropertyBits.0
= T T T T T VEMP.DebounceTime.1.TEST2 = 2000
VEMP.AppPropertyBits.1 = T T T T T
VEMP.DebounceTime.2.TEST3 = 2000 VEMP.AppPropertyBits.2
= T T T T T VEMP.DebounceTime.3.TEST4 = 2000
VEMP.AppPropertyBits.3 = T T T T T
VEMP.DebounceTime.4.TEST5 = 2000 VEMP.AppPropertyBits.4
= T T T T T

PTC Non-Vital Configuration (note: minimum number of entries is 1)

WIUGEN.BcnContinuous = Enabled
WIUGEN.BncOnChange = No
WIUGEN.ExtTimeUpdTimeout = 7200
WIUGEN.BcnRate = 1000
WIUGEN.BcnBitTime = 300
WIUGEN.BcnEndTime = 120
WIUGEN.MaxBcnInterval = 900
EMPWSM.SourceAddress =
EMPWSM.DestinationAddress =
EMPWSM.TimeFormat = Absolute
EMPWSM.Encryption = Disabled
EMPWSM.Compression = Disabled
EMPWSM.DataIntegrity = App Specific
EMPWSM.PTC_ReSyncEnable = Yes
EMPWSM.TTL_TimedBeacon = 12
EMPWSM.QoS_TimedBeacon = 16
EMPWSM.TTL_GetWSM = 12
EMPWSM.QoS_GetWSM = 16
EMPWSM.LRMMaxSecsTimeDif = 3
EMPWSM.NoTimeSyncMessage = 6
EMPD.DestinationIpAddress.1 = 10.255.255.210

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EMPD.Mode = Bidirectional
EMPD.LogTraffic = Yes
EMPD.DataAckEnabled = Yes
EMPD.DestinationIpPort.1 = 3001
EMPD.KeepAliveInterval = 30000
EMPD.KeepAliveAckTimeout = 15000
EMPD.DataAckTimeout = 15000
EMPD.DataNakRetryLimit = 3
EMPD.RetransmitDelay = 0
EMPD.ConnectionAttemptTimeout = 30000
EMPD.ConnectionDelay = 60000
EMPD.ConnectionRetryLimit = -1
EMPD.ReconnectionLimit = -1

SNMP General Configuration (note: minimum number of entries is 1)

SNMP.TrapEnable = Enabled SNMP.WiuHeartbeatLogEnable =
Disabled SNMP.DestUdpPort.1 = 162
SNMP.DestAdd.1 = 192.168.0.12
SNMP.DestUdpPort.2 = 162
SNMP.DestAdd.2 = 0.0.0.0
SNMP.DestUdpPort.3 = 162
SNMP.DestAdd.3 = 0.0.0.0
SNMP.DestUdpPort.4 = 162
SNMP.DestAdd.4 = 0.0.0.0
SNMP.WaysideDevType = ElectroLogIXS
SNMP.Location = undefined SNMP.PriComStr
=
SNMP.PubComStr =
SNMP.TemporaryTrapDisableTime = 60

ACPower.SNMP_TRAP.TrapEnable 0
ACPower.SNMP_TRAP.TrapText AC power loss detected
ACPower.SNMP_TRAP.ClearTrapText AC power detected

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ACPower.SNMP_TRAP.Time ACPower.SNMP_TRAP.ClearTime

ACPower.SNMP_TRAP.SpecificTrapEnable Enabled ACPower.SNMP_TRAP.TrapID 4
ACPower.SNMP_TRAP.ClearTrapID 83 ACPower.SNMP_TRAP.SpecTrapReason AC
Power loss detected ACPower.SNMP_TRAP.ClearSpecTrapReason AC Power detected
ACPower.SNMP_TRAP.Flag 1
ACPower.SNMP_TRAP.ClearFlag 2
ACPower.SNMP_TRAP.Priority 1
ACPower.SNMP_TRAP.ClearPriority 5 ACPower.SNMP_TRAP.TextField1
ACPower.SNMP_TRAP.ClearTextField1 ACPower.SNMP_TRAP.TextField2
ACPower.SNMP_TRAP.ClearTextField2

Temperature.SNMP_TRAP.TrapEnable 0
Temperature.SNMP_TRAP.TrapText Termperature out of range
Temperature.SNMP_TRAP.ClearTrapText Termperature OK
Temperature.SNMP_TRAP.Time Temperature.SNMP_TRAP.ClearTime

Temperature.SNMP_TRAP.SpecificTrapEnable Enabled Temperature.SNMP_TRAP.TrapID 5
Temperature.SNMP_TRAP.ClearTrapID 84 Temperature.SNMP_TRAP.SpecTrapReason
Temperature out of range Temperature.SNMP_TRAP.ClearSpecTrapReason Temperature
OK Temperature.SNMP_TRAP.Flag 1
Temperature.SNMP_TRAP.ClearFlag 2
Temperature.SNMP_TRAP.Priority 1
Temperature.SNMP_TRAP.ClearPriority 5 Temperature.SNMP_TRAP.TextField1
Temperature.SNMP_TRAP.ClearTextField1 Temperature.SNMP_TRAP.TextField2
Temperature.SNMP_TRAP.ClearTextField2

EnclosureDoor.SNMP_TRAP.TrapEnable 0
EnclosureDoor.SNMP_TRAP.TrapText Enclosure door open
EnclosureDoor.SNMP_TRAP.ClearTrapText Enclosure door closed
EnclosureDoor.SNMP_TRAP.Time EnclosureDoor.SNMP_TRAP.ClearTime

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EnclosureDoor.SNMP_TRAP.SpecificTrapEnable Enabled
EnclosureDoor.SNMP_TRAP.TrapID 6
EnclosureDoor.SNMP_TRAP.ClearTrapID 24 EnclosureDoor.SNMP_TRAP.SpecTrapReason
Enclosure door open EnclosureDoor.SNMP_TRAP.ClearSpecTrapReason Enclosure door closed
EnclosureDoor.SNMP_TRAP.Flag 1
EnclosureDoor.SNMP_TRAP.ClearFlag 2
EnclosureDoor.SNMP_TRAP.Priority 1
EnclosureDoor.SNMP_TRAP.ClearPriority 5 EnclosureDoor.SNMP_TRAP.TextField1
EnclosureDoor.SNMP_TRAP.ClearTextField1 EnclosureDoor.SNMP_TRAP.TextField2
EnclosureDoor.SNMP_TRAP.ClearTextField2

SignalingAlarm.SNMP_TRAP.TrapEnable 0 SignalingAlarm.SNMP_TRAP.TrapText
Signaling System Alarm SignalingAlarm.SNMP_TRAP.ClearTrapText Signaling
System Alarm OK

OpenTrackCKTDetected.SNMP_TRAP.SpecificTrapEnable Enabled
OpenTrackCKTDetected.SNMP_TRAP.TrapID 27
OpenTrackCKTDetected.SNMP_TRAP.ClearTrapID 28
OpenTrackCKTDetected.SNMP_TRAP.SpecTrapReason Open Trk Circuit Detected
OpenTrackCKTDetected.SNMP_TRAP.ClearSpecTrapReason Open Trk Circuit Detected OK
OpenTrackCKTDetected.SNMP_TRAP.Flag 1
OpenTrackCKTDetected.SNMP_TRAP.ClearFlag 2
OpenTrackCKTDetected.SNMP_TRAP.Priority 1
OpenTrackCKTDetected.SNMP_TRAP.ClearPriority 5
OpenTrackCKTDetected.SNMP_TRAP.TextField1
OpenTrackCKTDetected.SNMP_TRAP.ClearTextField1
OpenTrackCKTDetected.SNMP_TRAP.TextField2
OpenTrackCKTDetected.SNMP_TRAP.ClearTextField2

SystemHealth.SNMP_TRAP.TrapEnable 0 SystemHealth.SNMP_TRAP.TrapText
System Health SystemHealth.SNMP_TRAP.ClearTrapText System Health OK

ModuleHealth.SNMP_TRAP.SpecificTrapEnable Enabled
ModuleHealth.SNMP_TRAP.TrapID 29
ModuleHealth.SNMP_TRAP.ClearTrapID 30 ModuleHealth.SNMP_TRAP.SpecTrapReason
[Module] #: [Failure Message] ModuleHealth.SNMP_TRAP.ClearSpecTrapReason [Module] #:
[Failure Message] OK ModuleHealth.SNMP_TRAP.Flag 1
ModuleHealth.SNMP_TRAP.ClearFlag 2
ModuleHealth.SNMP_TRAP.Priority 1
ModuleHealth.SNMP_TRAP.ClearPriority 5 ModuleHealth.SNMP_TRAP.TextField1
ModuleHealth.SNMP_TRAP.ClearTextField1 ModuleHealth.SNMP_TRAP.TextField2
ModuleHealth.SNMP_TRAP.ClearTextField2

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ModuleRemoved.SNMP_TRAP.SpecificTrapEnable Enabled
ModuleRemoved.SNMP_TRAP.TrapID 31
ModuleRemoved.SNMP_TRAP.ClearTrapID 32 ModuleRemoved.SNMP_TRAP.SpecTrapReason IXC S# Removed ModuleRemoved.SNMP_TRAP.ClearSpecTrapReason IXC S# Removed OK
ModuleRemoved.SNMP_TRAP.Flag 1
ModuleRemoved.SNMP_TRAP.ClearFlag 2
ModuleRemoved.SNMP_TRAP.Priority 1
ModuleRemoved.SNMP_TRAP.ClearPriority 5 ModuleRemoved.SNMP_TRAP.TextField1
ModuleRemoved.SNMP_TRAP.ClearTextField1 ModuleRemoved.SNMP_TRAP.TextField2
ModuleRemoved.SNMP_TRAP.ClearTextField2

ModuleNotInstalled.SNMP_TRAP.SpecificTrapEnable Enabled
ModuleNotInstalled.SNMP_TRAP.TrapID 33
ModuleNotInstalled.SNMP_TRAP.ClearTrapID 34
ModuleNotInstalled.SNMP_TRAP.SpecTrapReason [VLD S#:/XCI] Not Installed

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ModuleNotInstalled.SNMP_TRAP.ClearSpecTrapReason [VLD S#:/XCI] Not Installed OK
ModuleNotInstalled.SNMP_TRAP.Flag 1
ModuleNotInstalled.SNMP_TRAP.ClearFlag 2
ModuleNotInstalled.SNMP_TRAP.Priority 1
ModuleNotInstalled.SNMP_TRAP.ClearPriority 5 ModuleNotInstalled.SNMP_TRAP.TextField1
ModuleNotInstalled.SNMP_TRAP.ClearTextField1
ModuleNotInstalled.SNMP_TRAP.TextField2
ModuleNotInstalled.SNMP_TRAP.ClearTextField2

CommunicationsLink.SNMP_TRAP.TrapEnable 0
CommunicationsLink.SNMP_TRAP.TrapText Communication link state
CommunicationsLink.SNMP_TRAP.ClearTrapText Communications link OK
CommunicationsLink.SNMP_TRAP.NumOfOcc
CommunicationsLink.SNMP_TRAP.Time

ClassDMessageError.SNMP_TRAP.SpecificTrapEnable Enabled
ClassDMessageError.SNMP_TRAP.TrapID 12
ClassDMessageError.SNMP_TRAP.ClearTrapID 36 ClassDMessageError.SNMP_TRAP.SpecTrapReason
Class D port error ClassDMessageError.SNMP_TRAP.ClearSpecTrapReason Class D port OK
ClassDMessageError.SNMP_TRAP.Flag 1
ClassDMessageError.SNMP_TRAP.ClearFlag 2
ClassDMessageError.SNMP_TRAP.Priority 1
ClassDMessageError.SNMP_TRAP.ClearPriority 5
ClassDMessageError.SNMP_TRAP.TextField1
ClassDMessageError.SNMP_TRAP.ClearTextField1
ClassDMessageError.SNMP_TRAP.TextField2
ClassDMessageError.SNMP_TRAP.ClearTextField2

VitalRemoteLinkError.SNMP_TRAP.SpecificTrapEnable Enabled
VitalRemoteLinkError.SNMP_TRAP.TrapID 13
VitalRemoteLinkError.SNMP_TRAP.ClearTrapID 38
VitalRemoteLinkError.SNMP_TRAP.SpecTrapReason Remote Link Error
VitalRemoteLinkError.SNMP_TRAP.ClearSpecTrapReason Remote Link OK
VitalRemoteLinkError.SNMP_TRAP.Flag 1
VitalRemoteLinkError.SNMP_TRAP.ClearFlag 2
VitalRemoteLinkError.SNMP_TRAP.Priority 1
VitalRemoteLinkError.SNMP_TRAP.ClearPriority 5
VitalRemoteLinkError.SNMP_TRAP.TextField1
VitalRemoteLinkError.SNMP_TRAP.ClearTextField1

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VitalRemoteLinkError.SNMP_TRAP.TextField2
VitalRemoteLinkError.SNMP_TRAP.ClearTextField2

OfficeCodeFail.SNMP_TRAP.SpecificTrapEnable Enabled OfficeCodeFail.SNMP_TRAP.TrapID 43
OfficeCodeFail.SNMP_TRAP.ClearTrapID 44 OfficeCodeFail.SNMP_TRAP.SpecTrapReason
Office Code Fail OfficeCodeFail.SNMP_TRAP.ClearSpecTrapReason Office Code Fail OK
OfficeCodeFail.SNMP_TRAP.Flag 1
OfficeCodeFail.SNMP_TRAP.ClearFlag 2
OfficeCodeFail.SNMP_TRAP.Priority 1
OfficeCodeFail.SNMP_TRAP.ClearPriority 5 OfficeCodeFail.SNMP_TRAP.TextField1
OfficeCodeFail.SNMP_TRAP.ClearTextField1

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OfficeCodeFail.SNMP_TRAP.TextField2
OfficeCodeFail.SNMP_TRAP.ClearTextField2

OfficeLinkFail.SNMP_TRAP.SpecificTrapEnable Enabled OfficeLinkFail.SNMP_TRAP.TrapID 45
OfficeLinkFail.SNMP_TRAP.ClearTrapID 46 OfficeLinkFail.SNMP_TRAP.SpecTrapReason Office Link Fail OfficeLinkFail.SNMP_TRAP.ClearSpecTrapReason Office Link Fail OK
OfficeLinkFail.SNMP_TRAP.Flag 1
OfficeLinkFail.SNMP_TRAP.ClearFlag 2
OfficeLinkFail.SNMP_TRAP.Priority 1
OfficeLinkFail.SNMP_TRAP.ClearPriority 5
OfficeLinkFail.SNMP_TRAP.TextField1
OfficeLinkFail.SNMP_TRAP.ClearTextField1
OfficeLinkFail.SNMP_TRAP.TextField2
OfficeLinkFail.SNMP_TRAP.ClearTextField2

DupMACDetected.SNMP_TRAP.SpecificTrapEnable Enabled
DupMACDetected.SNMP_TRAP.TrapID 47
DupMACDetected.SNMP_TRAP.ClearTrapID 48 DupMACDetected.SNMP_TRAP.SpecTrapReason Duplicate MAC DupMACDetected.SNMP_TRAP.ClearSpecTrapReason Duplicate MAC OK
DupMACDetected.SNMP_TRAP.Flag 1
DupMACDetected.SNMP_TRAP.ClearFlag 2
DupMACDetected.SNMP_TRAP.Priority 1
DupMACDetected.SNMP_TRAP.ClearPriority 5 DupMACDetected.SNMP_TRAP.TextField1
DupMACDetected.SNMP_TRAP.ClearTextField1 DupMACDetected.SNMP_TRAP.TextField2
DupMACDetected.SNMP_TRAP.ClearTextField2

DupIPAddressDetected.SNMP_TRAP.SpecificTrapEnable Enabled
DupIPAddressDetected.SNMP_TRAP.TrapID 49
DupIPAddressDetected.SNMP_TRAP.ClearTrapID 50
DupIPAddressDetected.SNMP_TRAP.SpecTrapReason Duplicate IP Port #
DupIPAddressDetected.SNMP_TRAP.ClearSpecTrapReason Duplicate IP Port # OK
DupIPAddressDetected.SNMP_TRAP.Flag 1
DupIPAddressDetected.SNMP_TRAP.ClearFlag 2
DupIPAddressDetected.SNMP_TRAP.Priority 1
DupIPAddressDetected.SNMP_TRAP.ClearPriority 5
DupIPAddressDetected.SNMP_TRAP.TextField1
DupIPAddressDetected.SNMP_TRAP.ClearTextField1

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DupIPAddressDetected.SNMP_TRAP.TextField2 DupIPAddressDetected.SNMP_TRAP.ClearTextField2

CrossingAlarm.SNMP_TRAP.TrapEnable 0
CrossingAlarm.SNMP_TRAP.TrapText Crossing Alarm
CrossingAlarm.SNMP_TRAP.ClearTrapText Crossing OK

CrossingHighSignalFault.SNMP_TRAP.SpecificTrapEnable Enabled
CrossingHighSignalFault.SNMP_TRAP.TrapID 51
CrossingHighSignalFault.SNMP_TRAP.ClearTrapID 52
CrossingHighSignalFault.SNMP_TRAP.SpecTrapReason XTI S# A#: High Sgnl
CrossingHighSignalFault.SNMP_TRAP.ClearSpecTrapReason XTI S# A#: High Sgnl OK
CrossingHighSignalFault.SNMP_TRAP.Flag 1
CrossingHighSignalFault.SNMP_TRAP.ClearFlag 2
CrossingHighSignalFault.SNMP_TRAP.Priority 1
CrossingHighSignalFault.SNMP_TRAP.ClearPriority 5 CrossingHighSignalFault.SNMP_TRAP.TextField1
CrossingHighSignalFault.SNMP_TRAP.ClearTextField1 CrossingHighSignalFault.SNMP_TRAP.TextField2
CrossingHighSignalFault.SNMP_TRAP.ClearTextField2

CrossingLowPhaseFault.SNMP_TRAP.SpecificTrapEnable Enabled
CrossingLowPhaseFault.SNMP_TRAP.TrapID 53
CrossingLowPhaseFault.SNMP_TRAP.ClearTrapID 54 CrossingLowPhaseFault.SNMP_TRAP.SpecTrapReason
XTI S# A#: Low Phase CrossingLowPhaseFault.SNMP_TRAP.ClearSpecTrapReason XTI S# A#: Low Phase
OK CrossingLowPhaseFault.SNMP_TRAP.Flag 1
CrossingLowPhaseFault.SNMP_TRAP.ClearFlag 2
CrossingLowPhaseFault.SNMP_TRAP.Priority 1
CrossingLowPhaseFault.SNMP_TRAP.ClearPriority 5
CrossingLowPhaseFault.SNMP_TRAP.TextField1
CrossingLowPhaseFault.SNMP_TRAP.ClearTextField1
CrossingLowPhaseFault.SNMP_TRAP.TextField2
CrossingLowPhaseFault.SNMP_TRAP.ClearTextField2

TransmitterCheckAlarm.SNMP_TRAP.SpecificTrapEnable Enabled
TransmitterCheckAlarm.SNMP_TRAP.TrapID 55
TransmitterCheckAlarm.SNMP_TRAP.ClearTrapID 56
TransmitterCheckAlarm.SNMP_TRAP.SpecTrapReason XTI S# A#: Xmit Chk
TransmitterCheckAlarm.SNMP_TRAP.ClearSpecTrapReason XTI S# A#: Xmit Chk OK
TransmitterCheckAlarm.SNMP_TRAP.Flag 1
TransmitterCheckAlarm.SNMP_TRAP.ClearFlag 2

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TransmitterCheckAlarm.SNMP_TRAP.Priority 1
TransmitterCheckAlarm.SNMP_TRAP.ClearPriority 5
TransmitterCheckAlarm.SNMP_TRAP.TextField1
TransmitterCheckAlarm.SNMP_TRAP.ClearTextField1
TransmitterCheckAlarm.SNMP_TRAP.TextField2
TransmitterCheckAlarm.SNMP_TRAP.ClearTextField2

XingTrackCKTCalRequired.SNMP_TRAP.SpecificTrapEnable Enabled
XingTrackCKTCalRequired.SNMP_TRAP.TrapID 57
XingTrackCKTCalRequired.SNMP_TRAP.ClearTrapID 58
XingTrackCKTCalRequired.SNMP_TRAP.SpecTrapReason XTI S# A#: Cal Req
XingTrackCKTCalRequired.SNMP_TRAP.ClearSpecTrapReason XTI S# A#: Cal Req OK
XingTrackCKTCalRequired.SNMP_TRAP.Flag 1
XingTrackCKTCalRequired.SNMP_TRAP.ClearFlag 2
XingTrackCKTCalRequired.SNMP_TRAP.Priority 1
XingTrackCKTCalRequired.SNMP_TRAP.ClearPriority 5
XingTrackCKTCalRequired.SNMP_TRAP.TextField1
XingTrackCKTCalRequired.SNMP_TRAP.ClearTextField1
XingTrackCKTCalRequired.SNMP_TRAP.TextField2
XingTrackCKTCalRequired.SNMP_TRAP.ClearTextField2

XingParamsDefaulted.SNMP_TRAP.SpecificTrapEnable Enabled
XingParamsDefaulted.SNMP_TRAP.TrapID 59
XingParamsDefaulted.SNMP_TRAP.ClearTrapID 60
XingParamsDefaulted.SNMP_TRAP.SpecTrapReason XTI S#: DfltAll Parm
XingParamsDefaulted.SNMP_TRAP.ClearSpecTrapReason XTI S#: DfltAll Parm OK
XingParamsDefaulted.SNMP_TRAP.Flag 1
XingParamsDefaulted.SNMP_TRAP.ClearFlag 2
XingParamsDefaulted.SNMP_TRAP.Priority 1
XingParamsDefaulted.SNMP_TRAP.ClearPriority 5
XingParamsDefaulted.SNMP_TRAP.TextField1
XingParamsDefaulted.SNMP_TRAP.ClearTextField1
XingParamsDefaulted.SNMP_TRAP.TextField2
XingParamsDefaulted.SNMP_TRAP.ClearTextField2

DecreasingPhaseFault.SNMP_TRAP.SpecificTrapEnable Enabled
DecreasingPhaseFault.SNMP_TRAP.TrapID 61
DecreasingPhaseFault.SNMP_TRAP.ClearTrapID 62
DecreasingPhaseFault.SNMP_TRAP.SpecTrapReason XTI S# A#: Dec Phase
DecreasingPhaseFault.SNMP_TRAP.ClearSpecTrapReason XTI S# A#: Dec Phase OK
DecreasingPhaseFault.SNMP_TRAP.Flag 1
DecreasingPhaseFault.SNMP_TRAP.ClearFlag 2

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DecreasingPhaseFault.SNMP_TRAP.Priority 1
DecreasingPhaseFault.SNMP_TRAP.ClearPriority 5
DecreasingPhaseFault.SNMP_TRAP.TextField1
DecreasingPhaseFault.SNMP_TRAP.ClearTextField1
DecreasingPhaseFault.SNMP_TRAP.TextField2
DecreasingPhaseFault.SNMP_TRAP.ClearTextField2

ApproachReleaseFault.SNMP_TRAP.SpecificTrapEnable Enabled
ApproachReleaseFault.SNMP_TRAP.TrapID 63
ApproachReleaseFault.SNMP_TRAP.ClearTrapID 64 ApproachReleaseFault.SNMP_TRAP.SpecTrapReason XTI S# A#: Appr Rel ApproachReleaseFault.SNMP_TRAP.ClearSpecTrapReason XTI S# A#: Appr Rel OK
ApproachReleaseFault.SNMP_TRAP.Flag 1
ApproachReleaseFault.SNMP_TRAP.ClearFlag 2
ApproachReleaseFault.SNMP_TRAP.Priority 1
ApproachReleaseFault.SNMP_TRAP.ClearPriority 5 ApproachReleaseFault.SNMP_TRAP.TextField1
ApproachReleaseFault.SNMP_TRAP.ClearTextField1 ApproachReleaseFault.SNMP_TRAP.TextField2
ApproachReleaseFault.SNMP_TRAP.ClearTextField2

FalseShuntFault.SNMP_TRAP.SpecificTrapEnable Enabled FalseShuntFault.SNMP_TRAP.TrapID 65
FalseShuntFault.SNMP_TRAP.ClearTrapID 66 FalseShuntFault.SNMP_TRAP.SpecTrapReason XTI S# A#: Fals Shnt FalseShuntFault.SNMP_TRAP.ClearSpecTrapReason XTI S# A#: Fals Shnt OK FalseShuntFault.SNMP_TRAP.Flag 1
FalseShuntFault.SNMP_TRAP.ClearFlag 2
FalseShuntFault.SNMP_TRAP.Priority 1
FalseShuntFault.SNMP_TRAP.ClearPriority 5 FalseShuntFault.SNMP_TRAP.TextField1
FalseShuntFault.SNMP_TRAP.ClearTextField1 FalseShuntFault.SNMP_TRAP.TextField2
FalseShuntFault.SNMP_TRAP.ClearTextField2

ConfigurationChange.SNMP_TRAP.TrapEnable 0 ConfigurationChange.SNMP_TRAP.TrapText Configuration Change

VitalConfigChange.SNMP_TRAP.SpecificTrapEnable Enabled
VitalConfigChange.SNMP_TRAP.TrapID 67
VitalConfigChange.SNMP_TRAP.SpecTrapReason Vital Config Param Changed
VitalConfigChange.SNMP_TRAP.Flag 1

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VitalConfigChange.SNMP_TRAP.Priority 1
VitalConfigChange.SNMP_TRAP.TextField1
VitalConfigChange.SNMP_TRAP.TextField2

NonVitalConfigChange.SNMP_TRAP.SpecificTrapEnable Enabled
NonVitalConfigChange.SNMP_TRAP.TrapID 69
NonVitalConfigChange.SNMP_TRAP.SpecTrapReason Non-Vital Config Param Changed
NonVitalConfigChange.SNMP_TRAP.Flag 1
NonVitalConfigChange.SNMP_TRAP.Priority 1
NonVitalConfigChange.SNMP_TRAP.TextField1
NonVitalConfigChange.SNMP_TRAP.TextField2

WIUHealth.SNMP_TRAP.TrapEnable 0
WIUHealth.SNMP_TRAP.TrapText WIU Health
WIUHealth.SNMP_TRAP.ClearTrapText WIU Health OK
WIUHealth.SNMP_TRAP.Time
WIUHealth.SNMP_TRAP.ClearTime

PTCDisabled.SNMP_TRAP.SpecificTrapEnable Enabled PTCDisabled.SNMP_TRAP.TrapID 7
PTCDisabled.SNMP_TRAP.ClearTrapID 72 PTCDisabled.SNMP_TRAP.SpecTrapReason
PTC Disabled PTCDisabled.SNMP_TRAP.ClearSpecTrapReason PTC Enabled
PTCDisabled.SNMP_TRAP.Flag 1
PTCDisabled.SNMP_TRAP.ClearFlag 2
PTCDisabled.SNMP_TRAP.Priority 1
PTCDisabled.SNMP_TRAP.ClearPriority 5 PTCDisabled.SNMP_TRAP.TextField1
PTCDisabled.SNMP_TRAP.ClearTextField1 PTCDisabled.SNMP_TRAP.TextField2
PTCDisabled.SNMP_TRAP.ClearTextField2

ProcessorReset.SNMP_TRAP.SpecificTrapEnable Enabled ProcessorReset.SNMP_TRAP.TrapID 8
ProcessorReset.SNMP_TRAP.ClearTrapID 74 ProcessorReset.SNMP_TRAP.SpecTrapReason
Processor C Reset ProcessorReset.SNMP_TRAP.ClearSpecTrapReason Processor C Reset clear
ProcessorReset.SNMP_TRAP.Flag 1
ProcessorReset.SNMP_TRAP.ClearFlag 2
ProcessorReset.SNMP_TRAP.Priority 1
ProcessorReset.SNMP_TRAP.ClearPriority 5 ProcessorReset.SNMP_TRAP.TextField1

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ProcessorReset.SNMP_TRAP.ClearTextField1 ProcessorReset.SNMP_TRAP.TextField2
ProcessorReset.SNMP_TRAP.ClearTextField2

ProgramFlashError.SNMP_TRAP.SpecificTrapEnable Enabled
ProgramFlashError.SNMP_TRAP.TrapID 9 ProgramFlashError.SNMP_TRAP.SpecTrapReason
Program Flash Fault ProgramFlashError.SNMP_TRAP.Flag 1
ProgramFlashError.SNMP_TRAP.Priority 1 ProgramFlashError.SNMP_TRAP.TextField1
ProgramFlashError.SNMP_TRAP.TextField2

LogFlashError.SNMP_TRAP.SpecificTrapEnable Enabled
LogFlashError.SNMP_TRAP.TrapID 10
LogFlashError.SNMP_TRAP.SpecTrapReason Log Flash Fault
LogFlashError.SNMP_TRAP.Flag 1
LogFlashError.SNMP_TRAP.Priority 1
LogFlashError.SNMP_TRAP.TextField1
LogFlashError.SNMP_TRAP.TextField2

HostLinkDown.SNMP_TRAP.SpecificTrapEnable Enabled
HostLinkDown.SNMP_TRAP.TrapID 11
HostLinkDown.SNMP_TRAP.ClearTrapID 80
HostLinkDown.SNMP_TRAP.SpecTrapReason Host link down
HostLinkDown.SNMP_TRAP.ClearSpecTrapReason Host link up
HostLinkDown.SNMP_TRAP.Flag 1
HostLinkDown.SNMP_TRAP.ClearFlag 2
HostLinkDown.SNMP_TRAP.Priority 1
HostLinkDown.SNMP_TRAP.ClearPriority 5 HostLinkDown.SNMP_TRAP.TextField1
HostLinkDown.SNMP_TRAP.ClearTextField1 HostLinkDown.SNMP_TRAP.TextField2
HostLinkDown.SNMP_TRAP.ClearTextField2

HMACRejection.SNMP_TRAP.TrapEnable 0
HMACRejection.SNMP_TRAP.TrapText HMAC rejection
HMACRejection.SNMP_TRAP.NumOfOcc HMACRejection.SNMP_TRAP.Time

HMACRejection.SNMP_TRAP.SpecificTrapEnable Enabled
HMACRejection.SNMP_TRAP.TrapID 14 HMACRejection.SNMP_TRAP.SpecTrapReason
HMAC rejection

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HMACRejection.SNMP_TRAP.Flag 1
HMACRejection.SNMP_TRAP.Priority 1
HMACRejection.SNMP_TRAP.TextField1
HMACRejection.SNMP_TRAP.TextField2

EMPCRCRejection.SNMP_TRAP.TrapEnable 0
EMPCRCRejection.SNMP_TRAP.TrapText EMP CRC rejection
EMPCRCRejection.SNMP_TRAP.NumOfOcc EMPCRCRejection.SNMP_TRAP.Time

EMPCRCRejection.SNMP_TRAP.SpecificTrapEnable Enabled
EMPCRCRejection.SNMP_TRAP.TrapID 15
EMPCRCRejection.SNMP_TRAP.SpecTrapReason EMP CRC rejection
EMPCRCRejection.SNMP_TRAP.Flag 1
EMPCRCRejection.SNMP_TRAP.Priority 1 EMPCRCRejection.SNMP_TRAP.TextField1
EMPCRCRejection.SNMP_TRAP.TextField2

HMACKeyChange.SNMP_TRAP.TrapEnable 0 HMACKeyChange.SNMP_TRAP.TrapText
HMAC key change

HMACKeyChange.SNMP_TRAP.SpecificTrapEnable Enabled
HMACKeyChange.SNMP_TRAP.TrapID 16 HMACKeyChange.SNMP_TRAP.SpecTrapReason
HMAC key change HMACKeyChange.SNMP_TRAP.Flag 1
HMACKeyChange.SNMP_TRAP.Priority 1
HMACKeyChange.SNMP_TRAP.TextField1
HMACKeyChange.SNMP_TRAP.TextField2

TimeSynchronizationError.SNMP_TRAP.TrapEnable 0
TimeSynchronizationError.SNMP_TRAP.TrapText Time sync error
TimeSynchronizationError.SNMP_TRAP.ClearTrapText Time sync error clear
TimeSynchronizationError.SNMP_TRAP.Time

TimeSyncExpired.SNMP_TRAP.SpecificTrapEnable Enabled
TimeSyncExpired.SNMP_TRAP.TrapID 17
TimeSyncExpired.SNMP_TRAP.ClearTrapID 88 TimeSyncExpired.SNMP_TRAP.SpecTrapReason
Time sync expired TimeSyncExpired.SNMP_TRAP.ClearSpecTrapReason Time sync OK
TimeSyncExpired.SNMP_TRAP.Flag 1
TimeSyncExpired.SNMP_TRAP.ClearFlag 2
TimeSyncExpired.SNMP_TRAP.Priority 1

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TimeSyncExpired.SNMP_TRAP.ClearPriority 5 TimeSyncExpired.SNMP_TRAP.TextField1
TimeSyncExpired.SNMP_TRAP.ClearTextField1 TimeSyncExpired.SNMP_TRAP.TextField2
TimeSyncExpired.SNMP_TRAP.ClearTextField2

TimeSyncNotInitialized.SNMP_TRAP.SpecificTrapEnable Enabled
TimeSyncNotInitialized.SNMP_TRAP.TrapID 18
TimeSyncNotInitialized.SNMP_TRAP.ClearTrapID 90
TimeSyncNotInitialized.SNMP_TRAP.SpecTrapReason Time sync not initialized
TimeSyncNotInitialized.SNMP_TRAP.ClearSpecTrapReason Time sync initialized
TimeSyncNotInitialized.SNMP_TRAP.Flag 1
TimeSyncNotInitialized.SNMP_TRAP.ClearFlag 2
TimeSyncNotInitialized.SNMP_TRAP.Priority 1
TimeSyncNotInitialized.SNMP_TRAP.ClearPriority 5
TimeSyncNotInitialized.SNMP_TRAP.TextField1
TimeSyncNotInitialized.SNMP_TRAP.ClearTextField1
TimeSyncNotInitialized.SNMP_TRAP.TextField2
TimeSyncNotInitialized.SNMP_TRAP.ClearTextField2

TimeSyncDeltaMsgTime.SNMP_TRAP.SpecificTrapEnable Enabled
TimeSyncDeltaMsgTime.SNMP_TRAP.TrapID 91
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearTrapID 92
TimeSyncDeltaMsgTime.SNMP_TRAP.SpecTrapReason Msg Delta Time
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearSpecTrapReason Msg Delta Time Clear
TimeSyncDeltaMsgTime.SNMP_TRAP.Flag 1
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearFlag 2
TimeSyncDeltaMsgTime.SNMP_TRAP.Priority 1
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearPriority 5
TimeSyncDeltaMsgTime.SNMP_TRAP.TextField1
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearTextField1
TimeSyncDeltaMsgTime.SNMP_TRAP.TextField2
TimeSyncDeltaMsgTime.SNMP_TRAP.ClearTextField2

TimeSyncMsgWindow.SNMP_TRAP.SpecificTrapEnable Enabled
TimeSyncMsgWindow.SNMP_TRAP.TrapID 93
TimeSyncMsgWindow.SNMP_TRAP.ClearTrapID 94 TimeSyncMsgWindow.SNMP_TRAP.SpecTrapReason Msg Delta Time Window TimeSyncMsgWindow.SNMP_TRAP.ClearSpecTrapReason Msg Delta Time Window Clear TimeSyncMsgWindow.SNMP_TRAP.Flag 1
TimeSyncMsgWindow.SNMP_TRAP.ClearFlag 2
TimeSyncMsgWindow.SNMP_TRAP.Priority 1

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TimeSyncMsgWindow.SNMP_TRAP.ClearPriority 5
TimeSyncMsgWindow.SNMP_TRAP.TextField1
TimeSyncMsgWindow.SNMP_TRAP.ClearTextField1
TimeSyncMsgWindow.SNMP_TRAP.TextField2
TimeSyncMsgWindow.SNMP_TRAP.ClearTextField2

TimeSyncLRMTime.SNMP_TRAP.SpecificTrapEnable Enabled
TimeSyncLRMTime.SNMP_TRAP.TrapID 95 TimeSyncLRMTime.SNMP_TRAP.SpecTrapReason
LRM Msg Delta Time TimeSyncLRMTime.SNMP_TRAP.Flag 1
TimeSyncLRMTime.SNMP_TRAP.Priority 1
TimeSyncLRMTime.SNMP_TRAP.TextField
1
TimeSyncLRMTime.SNMP_TRAP.TextField
2

ApplicationChanged.SNMP_TRAP.TrapEnable 0 ApplicationChanged.SNMP_TRAP.TrapText
PTC Application changed

SignalSystemAppChanged.SNMP_TRAP.SpecificTrapEnable Enabled
SignalSystemAppChanged.SNMP_TRAP.TrapID 97
SignalSystemAppChanged.SNMP_TRAP.SpecTrapReason Signal System App changed
SignalSystemAppChanged.SNMP_TRAP.Flag 1
SignalSystemAppChanged.SNMP_TRAP.Priority 1 SignalSystemAppChanged.SNMP_TRAP.TextField1
SignalSystemAppChanged.SNMP_TRAP.TextField2

PTCMappingFileChanged.SNMP_TRAP.SpecificTrapEnable Enabled
PTCMappingFileChanged.SNMP_TRAP.TrapID 20
PTCMappingFileChanged.SNMP_TRAP.SpecTrapReason PTC Mapping File changed
PTCMappingFileChanged.SNMP_TRAP.Flag 1
PTCMappingFileChanged.SNMP_TRAP.Priority 1 PTCMappingFileChanged.SNMP_TRAP.TextField1
PTCMappingFileChanged.SNMP_TRAP.TextField2

PTCConfigFileChanged.SNMP_TRAP.SpecificTrapEnable Enabled
PTCConfigFileChanged.SNMP_TRAP.TrapID 21
PTCConfigFileChanged.SNMP_TRAP.SpecTrapReason PTC Config File changed
PTCConfigFileChanged.SNMP_TRAP.Flag 1
PTCConfigFileChanged.SNMP_TRAP.Priority 1
PTCConfigFileChanged.SNMP_TRAP.TextField1
PTCConfigFileChanged.SNMP_TRAP.TextField2

InvalidWaysideDeviceStatus.SNMP_TRAP.TrapEnable 0

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InvalidWaysideDeviceStatus.SNMP_TRAP.TrapText Invalid wayside device status
InvalidWaysideDeviceStatus.SNMP_TRAP.Time

InvalidWaysideDeviceStatus.SNMP_TRAP.SpecificTrapEnable Enabled
InvalidWaysideDeviceStatus.SNMP_TRAP.TrapID 22
InvalidWaysideDeviceStatus.SNMP_TRAP.SpecTrapReason Dev:<device name> Val:<device value>
InvalidWaysideDeviceStatus.SNMP_TRAP.Flag 1
InvalidWaysideDeviceStatus.SNMP_TRAP.Priority 1
InvalidWaysideDeviceStatus.SNMP_TRAP.TextField1
InvalidWaysideDeviceStatus.SNMP_TRAP.TextField2

WIUHeartbeat.SNMP_TRAP.TrapEnable 0
WIUHeartbeat.SNMP_TRAP.TrapText WIU Heartbeat
WIUHeartbeat.SNMP_TRAP.Time

WIUHeartbeat.SNMP_TRAP.SpecificTrapEnable Enabled
WIUHeartbeat.SNMP_TRAP.TrapID 23
WIUHeartbeat.SNMP_TRAP.SpecTrapReason WIU Heartbeat
WIUHeartbeat.SNMP_TRAP.Flag 1

HMAC configuration file

KEY.hmac-hex 1508BB10D2B76533767B4B0559E4D7182C85F1961DC6B964

SSH public key Authorized Key file

ssh-rsa
AAAAB3NzaC1yc2EAAAABJQAAAIB2Zig185ks4/UYEj1G7f37IaVxHOyEsowyzBrPo2jvVgW4ZztLejFcUhUu+
9bWJ3T2q+HN1D4vvQTjfGSF819+R+DMRJJtVR+Xw9DnlufnBG3MztbhpO1FSfDeoS0C5SPiQAB/DYflzItAr
+V2e5a3VU2NHtxHWlsKQ86TA39RAQ== rsa-key-20120425

Selective Function Key file

Pound in first position indicates Comment Line
Date: 06-26-12
multiple keys allowed, one per line
SFKEY HA619711
SFKEY Ha929023
SFKEY HA713934

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SSH File Type	Description	Generated by	Example	Suffix
vcf	Vital Text Configuration File	Text Editor; ssh get vcf command	See PTC Vital Configuration on Example configuration files tab	.txt
nvcf	Non-Vital Text Configuration File	Text Editor; ssh get nvcf command	See PTC Non-Vital Configuration on Example configuration files tab	.txt
snmpcf	SNMP Text Configuration File	Text Editor; ssh get snmpcf command	See SNMP General Configuration on Example configuration files tab	.txt
snmpbin	SNMP Binary Configuration file	WIU WebGUI ->Configuration->SNMP General Configuration-> Download SNMP Configuration File dialog.	IXS_SNMP_Config.cfg	.cfg
boot	System Executive Boot executable file	GE Transportation Software Development	vpmallepm_boot.bin	.bin
exec	System Executive executable file	GE Transportation Software Development	vpmallepm.bin	.bin
ptcconfig	PTC Configuration file	Positive Train Control Configuration Suite, Configuration Tool	PTC_Long_3head_ELX.ptcbcfg	.ptcbcfg
ptcmap	PTC Mapping file	Positive Train Control Configuration Suite, Configuration Tool	PTC_Long_3head_ELX.ptcbmap	.ptcbmap
app	ElectroLogIXS Application file	ACE application editor	ptc_long_3head.mb1	.mb1
rc2	PTC EMP RC2 key file	Positive Train Control Configuration Suite, RC2 Generator	RC2Key_ELX3head.ptcRC2	.ptcRC2
hmac	PTC EMP Encrypted HMAC key file	Text editor	See HMAC Configuration file on Example configuration files tab	.txt
authkey	SSH public key Authorized Key file	SSH keygen or PuTTYgen and text editor	See HMAC Configuration file on Example configuration files tab	.txt

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SSH File Type	Description	Generated by	Example	Suffix
selective	Selective function key file	Text editor	See Select Function Key file on Example configuration files tab	.txt

Examples

Activity	Remote Computer Command	WIU SSH Command	Result	Product
Create PTC vital configuration file to default file name	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH > get vcf SUCCESS - Created file : config_vcf.txt	creates PTC Vital configuration file	config_vcf.txt
Create PTC vital configuration file to named file	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH > get vcf ptc_vital_cfg.txt SUCCESS - Created file : ptc_vital_cfg.txt	creates PTC Vital configuration file	ptc_vital_cfg.txt
View created files on WIU	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH > show files Upload Software Files Saved Configuration Files config_vcf.txt ptc_vital_cfg.txt	shows created configuration files	
Copy created files with scp to remote computer C: directory using putty	C: pscp -scp -pw sshuser config_vcf.txt admin@192.168.0.11:config_vcf.txt		config_vcf.txt is copied from WIU to C: directory on remote computer	config_vcf.txt
Copy created files with sftp to remote computer C: directory using putty	C: pscp -sftp -pw sshuser config_vcf.txt admin@192.168.0.11:config_vcf.txt		config_vcf.txt is copied from WIU to C: directory on remote computer	config_vcf.txt
Activity	**Remote Computer Command**	**WIU SSH Command**	**Result**	**Product**
Upload modified PTC non-vital text configuration file	C: pscp -sftp -pw sshuser admin@192.168.0.11:config_nvcf.txt config_nvcf.txt		config_nvcf.txt is copied from C: directory on remote computer to WIU	config_nvcf.txt
confirm that modified PTC non-vital text configuration file was uploaded	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH > show files Upload Software Files Saved Configuration Files config_nvcf.txt		

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Activity	Remote Computer Command	WIU SSH Command	Result	Product
Validate uploaded PTC non-vital text configuration file	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH> validate nvcf config_nvcf.txt WIUGEN.BcnContinuous Enabled WIUGEN.BcnOnChange No WIUGEN.MaxBcnInterval 900 EMPWSM.SourceAddress XX.w.456789:10.wiu EMPWSM.DestinationAddress XX.L.X.000000:tmc EMPD.DestinationIpAddress.1 192.168.0.12 EMPD.DestinationIpPort.1 3001 EMPD.ConnectionRetryLimit -1 EMPD.ReconnectionLimit -1 SUCCESS - Non-vital text file validated and uploaded. SSH>	config_nvcf.txt is validated and moved from the Saved Configuration File area to the Upload Software Files area on the WIU	validated non-Vital Config Text file
Apply the validated PTC non-vital text configuration file		SSH> apply nvcf WIUGEN.BcnContinuous Enabled WIUGEN.BcnOnChange No WIUGEN.MaxBcnInterval 900 EMPWSM.SourceAddress XX.w.456789:10.wiu EMPWSM.DestinationAddress XX.L.X.000000:tmc EMPD.DestinationIpAddress.1 192.168.0.12 EMPD.DestinationIpPort.1 3001 EMPD.ConnectionRetryLimit -1 EMPD.ReconnectionLimit -1 SUCCESS - Non-vital text file validated and uploaded. SSH>	validated nvcf configuration is applied	PTC non vital parameters are modified.
Stage, check and apply individual parameters	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH > stage WIUGEN.BcnContinuous Disabled SSH > stage EMPD.ConnectionDelay 900 SSH > checknv WIUGEN.BcnContinuous staged with Disabled EMPD.ConnectionDelay staged with 900 SSH > apply nvcf WIUGEN.BcnContinuous applied with Disabled	staged parameters are applied	

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Activity	Remote Computer Command	WIU SSH Command	Result	Product
		EMPD.ConnectionDelay applied with 900 SUCCESS - Nonvital text file or staged parameters applied		

Activity	Remote Computer Command	WIU Command	Result	Product
Upload application file h202.mb1	C: pscp -sftp -pw sshuser h202.mb1 admin@192.168.0.11:h202.mb1		h202.mb1 application file is uploaded to the saved configuration area of the WIU	
Validate the Uploaded h202.mb1 file	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH > validate app h202.mb1 Application File: IWP multi-application EPROM H202 created 10/03/12 by ACE Version 4.9 Build: 101910 MultiApp EPROM EPT CRC: 4E7B Application file validated and uploaded.	h202.mb1 application file is uploaded to the saved configuration area of the WIU	
Apply the application	Log on the WIU using the WebGUI Navigate to the Configuration -> Apply Software web page Establish Local Presence Select Apply Uploaded Aplication file button		System will apply the new application file and automatically reset.	
Select the application	Log on the WIU using the WebGUI Navigate to the Configuration -> Application web page Establish Local Presence Select the desired application		System will apply the selected application and automatically reset.	

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Activity	Remote Computer Command	WIU SSH Command	Result	Product
Upload exec file vpmallepm.bin	C: pscp -sftp -pw sshuser vpmallepm.bin admin@192.168.0.11: vpmallepm.bin		vpmallepm.bin application file is uploaded to the saved configuration area of the WIU	
Validate the Uploaded vpmallepm.bin file	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH > validate exec vpmallepm.bin VPM A Exec Image - Version: FULL Bld0132F Size: 954288 CRC: 2825ADAE VPM B Exec Image - Version: FULL Bld0132F Size: 921728 CRC: E27636F0 VPM C Exec Image - Version: FULL Bld0132F Size: 2301656 CRC: F1DB5E46 SUCCESS : Exec file validated and uploaded.	vpmallepm.bin is validated and moved from the saved configuration files area tio the Upload Software files area on the WIU.	
Apply the executive	Log on the WIU using the WebGUI Navigate to the Configuration -> Apply Software web page Establish Local Presence Select Apply Uploaded Exec file button		System will apply the new executive and automatically reset.	
Activity	**Remote Computer Command**	**WIU SSH Command**	**Result**	**Product**
Create PTC encrypted HMAC file	In a text editor (notepad) enter KEY.hmac-hex followed by the 24 character hex encrypted HMAC - 1508BB10D2B76533767B4B0559E4D7182C85F1961DC6B964 Save the file with a .txt suffix			
Upload the encrypted HMAC file	C: pscp -sftp -pw sshuser hmac_file.txt admin@192.168.0.11:hmac_file.txt		hmac_file.txt is uploaded to the saved configuration file area	

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Activity	Remote Computer Command	WIU SSH Command	Result	Product
Validate the encrypted HMAC file without command line effectivity date/time - system will prompt for date and time. Defaults to current date time.	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH> validate hmac hmac_file.txt At what date do you want to apply it (02/27/2013 | exit)? At what time do you want to apply it (11:04:23 | exit)? SUCCESS - HMAC file validated and uploaded. (CRC = =0x0E371581) Apply Date and Time 11:4:23 2/27/2013	hmac_file.txt is validated and moved from the saved configuration area to the uploaded configuration area	
Alternately, can validate the encrypted HMAC file with command line Date/Time arguments		SSH> validate hmac hmac_file.txt 02/28/2013 12:00:00 SUCCESS - HMAC file validated and uploaded. (CRC = =0x0E371581) Apply Date and Time 12:0:0 2/28/2013	hmac_file.txt is validated and moved from the saved configuration area to the uploaded configuration area	
Apply the encrypted HMAC	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH > apply hmac Successfully applied. <uploaded HMAC Key File deleted>	encrypted HMAC is applied	
Activity	**Remote Computer Command**	**WIU SSH Command**	**Result**	**Product**
Upload SSH public key file authorized_ keys.txt	C: pscp -sftp -pw sshuser authorized_keys.txt admin@192.168.0.11:authorized _keys.txt			
validate authorized_ keys.txt with command line Date/Time arguments	log on to WIU to open an SSH session: C: plink -ssh -pw sshuser admin@192.168.0.11	SSH> validate authkey authorized_keys.txt 02/28/2013 12:00:00 03/30/2013 11:59:59 SUCCESS - SSH authorized key file validated and uploaded. Apply : 02/28/2013 12:00:00 Expire : 03/30/2013 11:59:59	authorized_ keys.txt is validated and moved from the saved configuration area to the uploaded configuration area	
Apply the authorized_ key.txt file		SSH> apply authkey Success - Authorized Keys File Applied.	SSH public authorized keys are applied	

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Appendix E – PMD-4/PMD-4R Safety Related Application Conditions

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Appendix E – PMD-4/PMD-4R Safety Related Application Conditions

This appendix provides all safety related product restrictions and ferrite installations indicated in the appropriate sections of the manual.

Safety Related Application conditions (SRAC)

General

SRAC1 Installation, Configuration, & Maintenance must be performed in accordance with the applicable PMD-4/PMD-4R Operation and Maintenance Manual. Where identified in the O&M manual, Installer/Railway specific procedures must be developed and followed to mitigate installer/maintainer error.

SRAC2 The fail-safety of the PMD-4/PMD-4R equipment is dependent on timely maintenance (i.e. without undue delay). If any failure of the equipment is detected, it is the responsibility of the railway authority to ensure the failure is reported in a timely manner. Once the failure is reported the appropriate steps must be taken to ensure the equipment is repaired or replaced promptly.

Security

SRAC3 The responsibility for securing the PMD-4/PMD-4R equipment from un-authorized physical access lies with the railway authority.

SRAC4 The responsibility for the security of passwords relating to equipment access lies with the railway authority. Passwords should be of a non-obvious nature and of sufficient length to prevent unauthorized access.

Configuration Management

SRAC5 Configuration Management Procedures must be established to ensure that all PMD-4/PMD-4R units are properly configured regarding the following items:

- Modules must be correct part with a greater revision than the minimum as defined by GE's minimum modification procedure (082745-025)
- Executive must be correct software and revision, and must be a greater revision than the minimum as defined by GE's minimum modification procedure (082745-025)
- Application Logic must be the correct file and revision
- PTC Mapping File must be the correct file and revision

When a required min mod is identified by GE Transportation Systems Global Signaling, LLC, the PMD-4/PMD-4R executive software and/or modules must be updated in a timely manner.

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SRAC6 Configuration Management Procedures must be established to ensure that PMD-4/PMD-4R units are configured with the proper values for the following field settable configuration settings:

- Vital Configuration Settings (vital soft switches)
- General Purpose Vital Timers
- Slow Pick/Slow Release Timers
- Vital Remote Parameters (Local & Remote Network ID, MRTD, MSTD, Link Down Status Behavior)
- PTC Settings (PTC applicability setting, PTC debounce time, PTC WIU address)
- Crossing Parameters
- Safe State Retention Parameters.

Field settable vital configuration settings must be indicated on site plans.

SRAC7 Configuration Management Procedures must be established to ensure that vital communications interfaces of PMD-4/PMD-4R units are properly configured:

- When RP2000/RP2009 is used, each Local Network ID must not be duplicated by another unit on the same physical network, and each Local/Remote Network ID pair of each link must not be duplicated on a unit. If duplicates are used for redundancy, the application/installation must ensure that only one of the duplicate pairs is active/operational at a given time[1].
- When PTC is enabled, each Wayside Interface Unit (WIU) address must be unique.

[1]Non-duplication of addresses within the same physical network must be ensured as further described in the PMD-4/PMD-4R Operation and Maintenance Manual.

SRAC8 When a VLD-R8AC module is used, Railroad Configuration Management Procedures must ensure the installed AC lamp type corresponds with the defined & selected AC Lamp Load Type.

Application Design

SRAC9 PMD-4/PMD-4R Application Logic development is the responsibility of the Application Engineer. Warnings contained in the Logic Station Tool must be adhered to and sufficient verification must be performed prior to use in revenue service. Application Design and Verification must be performed in accordance with standard railroad, FRA, and/or other regulatory agency rules.

SRAC10 PTC Mapping File and PTC Configuration file development is the responsibility of the Application Engineer. Warnings contained in the PTC Configuration Tool must be adhered to and sufficient verification must be performed prior to use in revenue service. Application Design and Verification must be performed in accordance with standard railroad, FRA, and/or other regulatory agency rules.

SRAC11 Applications of PMD-4/PMD-4R must treat the following conditions as the fail-safe state of the PMD-4/PMD-4R vital interfaces:

- Discrete Vital Output – Continuously de-energized
- Discrete Vital Input – Intermittently or continuously de-energized[1]
- Cab Code Output – Cessation of valid Cab Code generation[2]
- Vital Remote Communications – Unhealthy Link status & cessation of valid message transmission
- PTC Wayside Status Communications – Cessation of valid message transmission
- Vital Track Interface – Cessation of Outgoing Track Codes & No Incoming Track Codes (Occupied)
- VLD-C6S Lamp Output – De-energized lamps
- VLD-R16S/VLD-R8AC Lamp Output – De-energized VSSR
- Crossing Prediction & Motion Detection – De-energized MDR status
- Crossing Device Control (Lamps & Gates) – Activated

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1) Under failure conditions a Vital Input may intermittently de-energize. Applications must be designed such that an intermittently de-energized input when should be energized does not create a hazard.

2) Under failure conditions a cab code output may output a constant carrier or no carrier. Applications must treat constant carrier and no carrier as a restrictive cab code.

SRAC12 Applications of PMD-4/PMD-4R must not use the following elements, functions, and interfaces for implementing safety-critical functions:

- Module health statuses
- ElectroCode track codes 1, 5, 6 & M
- Non-vital equation processing
- Non-vital timers
- Non-vital inputs
- Non-vital outputs
- Office protocols
- Diagnostics interfaces & information[1]

[1]Information provided via diagnostic interfaces is non-vital and should not be relied on for safety critical decisions.

SRAC13 PMD-4/PMD-4R Application Logic must define default values that are safe in every application for the following field settable configuration settings:

- Vital Configuration Settings (vital soft switches)
- General Purpose Vital Timers
- Slow Pick/Slow Release Timers
- Vital Remote Parameters (MRTD, MSTD, Link Timeout, HMI, & AT)
- Safe State Retention Parameters.

If field set values become corrupted they will revert to the default values contained in the PMD-4/PMD-4R Application Logic.

SRAC14 Applications of PMD-4/PMD-4R must be designed such that Vital Remote communication failure results in a safe state and must not depend on the vital statuses of the remote unit transitioning to their intended state or failsafe state in a shorter duration than specified below:

- Link Timeout + MRTD [RP1992/RP2000]
- HMI + AT + MRTD [RP2009]

SRAC15 When vital remote links are used, PMD-4/PMD-4R Application Logic or site specific plans must define values for the following parameters that are appropriate to ensure safe operation for the intended installation:

- MSTD / MRTD parameters set the minimum message periodicity and maximum link latency respectively
- Link Timeout parameter sets the maximum allowable staleness of received vital remote status data (does not account for link latency) [RP1992/RP2000]
- HMI & AT parameters in combination set the maximum allowable staleness of vital remote status data (does not account for link latency) [RP2009]
- Link Down Behavior sets the behavior of statuses during a link down condition.

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SRAC16 When vital remote links are used on networks where the threat of masquerade (spoofing) is not sufficiently mitigated per applicable standards/regulations (e.g. through external devices), the PMD-4/PMD-4R Application Logic must use RP2000/RP2009 with MAC enabled.

SRAC17 When a VLD-R8AC module is used, the PMD-4/PMD-4R Application Logic must define an AC Lamp Load Type Table and select a compatible load type for each lamp output. An incorrectly defined load type may prevent lamp failures from being detected.

SRAC39 Applications of PMD-4/PMD-4R employing Signal Aspects that use multiple lamps must ensure that all lamps for a Signal Aspect are driven by a single chassis.

Interface

SRAC18 A non-vital input of an PMD-4/PMD-4R must not be used for monitoring vital signals, since failure could falsely energize or corrupt the monitored signal.

SRAC19 When VLD-R8AC or VLD-R16S modules are used, the lamp input power must be supplied through the contacts of a failsafe relay (or equivalent device) controlled by the VSSR output of the associated lamps as described in the PMD-4/PMD-4R Operation and Maintenance Manual.

SRAC20 When an PMD-4/PMD-4R Application requires Light Out Detection (LOD), Signal Lamps and associated equipment (e.g. inline DC/DC converters) must be designed such that a failed lamp cannot appear to be an intact filament to a probability consistent with the allocated SIL.

SRAC21 When an PMD-4/PMD-4R Application requires Light Out Detection (LOD), external devices connected to signal lamp wiring (e.g. lightning protection) must be applied such that a failed device cannot appear to be an intact filament to a probability consistent with the allocated SIL.

SRAC22 The RP1992 protocol must only be used over hard-wired point to point networks where it is impossible for remote messages to be received out of order. If media converters are used, they must not be capable of significantly delaying or storing more than one RP1992 message.

SRAC23 When Track Occupancy Detection is used as a vital PMD-4/PMD-4R function, sufficient shunting must be ensured by proper track design and shall account for track length, worst case ballast, and worst case shunt impedance.

SRAC24 When the PMD-4/PMD-4R is used to drive Signal Aspects that use multiple lamps where an improperly displayed aspect may be more permissive, light out detection must be utilized. External light out detection must be used when not provided by the PMD-4/PMD-4R module (e.g. VIO module driving lamp via relay).

SRAC25 The correctness of externally supplied vital data (e.g. Discrete Vital Input) must be ensured by the external device.

SRAC26 The fail-safety of an PMD-4/PMD-4R VIOxx-86S vital input is dependent on the input voltage being less than the SIL-4 Off Threshold as defined below when intended to be off:

- VIO50-86S: < 12.5Vdc

1) VIO24-86S: < 6Vdc
2) VIO12-86S: < 3Vdc

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SRAC27 The fail-safety of an PMD-4/PMD-4R VIO50-86S vital output is dependent on the load device satisfying at least one of the following criteria:

3) Device has impedance between 50-2500ohms, and requires greater than 7Vdc for longer than 50ms to transition to a permissive state (e.g. typical vital relay)
4) Device has impedance between 50-5500ohms, and requires greater than 7Vdc for longer than 200ms to transition to a permissive state (e.g. PMD-4/PMD-4R Vital Input)
5) Device has impedance between 50-5500ohms, and a momentary transition to a permissive state for less than 200ms is not hazardous in the application.

Installation, Operation & Maintenance

SRAC28 Adequate testing must be performed after installation or maintenance to detect any errors/failures of the application equations, PTC mapping rules, vital settings, equipment, or installation before the unit is placed into service. Testing must be performed in accordance with standard railroad, FRA, and/or other regulatory agency rules.

SRAC29 After updating the VPM executive, applying a new application program, or replacing the PMD-4/PMD-4R Chassis LRU the Installer/Maintainer must confirm all vital field settable configuration settings prior to placing the unit in service, including but not limited to the following:

6) Vital Configuration Settings (vital soft switches)
7) General Purpose Vital Timers
8) Slow Pick/Slow Release Timers
9) Vital Remote Parameters (Local & Remote Network ID, MRTD, MSTD, Link Timeout, HMI, AT)
10) PTC Settings (applicability setting, PTC debounce time, PTC WIU address)
11) Crossing Parameters
12) Safe State Retention Parameters

SRAC30 After applying a new PTC mapping file or PTC configuration file, the Installer/Maintainer must confirm all vital field settable PTC related configuration settings prior placing the unit in service, including but not limited to the following:

13) PTC WIU address
14) PTC applicability setting
15) PTC debounce time

SRAC31 Maintenance personnel must not base safety related decisions upon the Real-Time Status Display. The Real-Time Status display is for diagnostic use only and is not a fail-safe device.

SRAC32 When installing or replacing a VIOxx-86S Personality Module, the voltage type must be verified against site plans.

SRAC33 Maintainer must confirm that all failed modules have been replaced prior to clearing Safe State Retention.

SRAC34 When Normal/Standby configurations are used, maintenance personnel must examine Health LEDs and error logs during periodic inspections to detect failures in the inactive modules.

SRAC35 Procedures must be established to ensure that track transmit voltage levels and receive current thresholds associated with PMD-4/PMD-4R track circuits are inspected and adjusted on a periodic basis, and after maintenance actions affecting the track circuit.

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SRAC36 Correct detection of trains for crossing warning equipment is dependent upon:

16) Adequate rail to rail shunting
17) Ballast conditions must not interfere with shunt detection
18) Rail connected devices must non-interfere with shunt detection
19) Rails and wheels must be maintained to ensure adequate Rail-Wheel contact.
20) Periodic inspection and maintenance must be performed to ensure ballast, rails and other rail-attached equipment does not interfere with shunt detection.

Regulatory

~~**SRAC37** The Safe State Retention functionality must be enabled with appropriate SSR parameters for applications requiring CENELEC compliance.~~

SRAC38 Decommissioning plan for the PMD-4/PMD-4R units is the responsibility of the owning railway authority.

SRAC40 The PMD-4/PMD-4R does not detect temperatures exceeding the product specification unless explicitly configured to implement this functionality. If required by applicable regulations and standards, measures against temperature increase beyond product specifications must be implemented at the application level.